1895

Iowa State College of Agriculture and Mechanic Arts

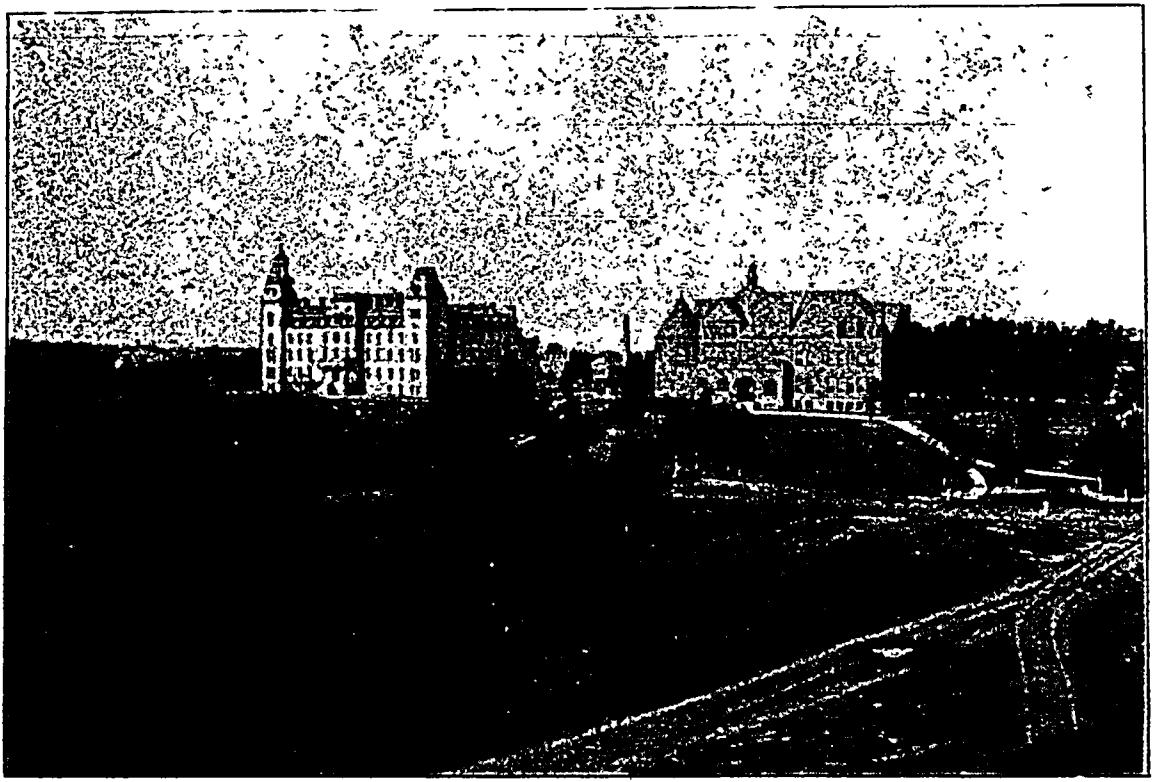
Iowa State University

To New Students:

Members of the Young Men's and Young Women's Christian Association (wearing ribbon badges of the reception committee), will be in attendance at all trains during the first week or so of each college term, to look after the welfare of new students and furnish information. Don't be afraid to ask questions.

A yearly hand-book of information concerning college and association work is published by the Y. M. and Y. W. C. A. Mailed free on application. Address Hand-Book Committee, Iowa Agricultural College, Ames, Iowa. We send you a welcome in advance

Y. M. and Y. W. C. A. Reception Committee.



MORRILL HALL AND MAIN BUILDING FROM THE TOP OF AGRICULTURAL HALL.

IOWA STATE COLLEGE

. OF .

AGRICULTURE

. AND

MECHANIC ARTS.

CATALOG 1895-96.

"SCIENCE WITH PRACTICE."

1895
BY THE COLLEGE,
AMES.

CEDAR RAPIDS, IOWA:
REPUBLICAN PRINTING CO., PRINTERS AND BINDERS
1895.

CALENDAR FOR 1896.

First Term begins - - -	Tuesday, February 25.
Entrance Examinations -	Tuesday, February 25. Wednesday, February 26.
Recitations begin - - -	Thursday, February 27.
Memorial Day - - -	Saturday, May 30.
Term Examinations - -	June 8 to 17.
Junior Exhibition - -	Wednesday, June 17.
Second Term begins - -	Tuesday, July 14.
Entrance Examinations -	Tuesday, July 14. Wednesday, July 15.
Recitations begin - - -	Thursday, July 16.
Term Examinations - -	November 3 to November 11.
Baccalaureate Sermon - -	Sunday, November 8.
Address before Trustees -	Tuesday, November 10.
Commencement Exercises -	Wednesday, November 11.

Winter Vacation from November 11, '96, to February 23, 1897.

BOARD OF TRUSTEES.

	Term Expires.
First District—HON. HAMILTON SMITH, Fairfield	1898
Second District—HON. C. M. DUNBAR, Maquoketa	1898
Third District- HON. J. S. JONES, Manchester	1896
Fourth District—HON. A. SCHEMERHORN, Charles City	1898
Fifth District—HON. A. V. STOUT, Parkersburg	1900
Sixth District HON. W. O. MCELROY, Newton	1896
Seventh District- HON. C. F. SAYLOR, Des Moines	1900
Eighth District—HON. A. B. SHAW, Corning	1898
Ninth District- HON. J. H. WOOD, Atlantic	1896
Tenth District HON. J. B. HUNGERFORD, Carroll	1900
Eleventh District HON. A. F. MESERVEY, Cherokee	1900

OFFICERS OF THE BOARD.

HON. W. O. MCELROY, Newton	*Chairman.*
E. W. STANTON, Ames	*Secretary.*
HERMAN KNAPP, Ames	*Treasurer.*
J. F. CAVELL, Ames	*Steward.*

MEETINGS.

The annual meeting of the Board of Trustees is held on the second Wednesday of November; also a second meeting in May, and others if occasion requires.

DIRECTION.

All correspondence concerning College matters may be addressed:

W. M. BEARDSHEAR, *President,*
Ames, Iowa.

OFFICERS OF INSTRUCTION.

W. M. BEARDSHEAR, A. M , LL. D., PRESIDENT.
Professor of Psychology and Ethics.

M. STALKER, M. Sc., V. S.,
Professor of Veterinary Science.

J. L. BUDD, M. H.,
Professor of Horticulture.

E. W. STANTON, M. Sc.,
Professor of Mathematics and Economic Science.

GEN JAMES RUSH LINCOLN,
Professor of Military Science and Mining Engineering.

A. A. BENNETT, M. Sc.,
Professor of Chemistry.

HERBERT OSBORN, M. Sc.,
Professor of Zoology and Entomology.

L. H. PAMMEL, B. AGR., M. Sc.,
Professor of Botany.

MRS. ELIZA OWENS,
Professor of Domestic Economy.

JAMES WILSON,
Professor of Agriculture and Director of Experiment Station.

MISS MARGARET DOOLITTLE, A. B.,
Professor of English, Latin and Rhetoric.

W. S. FRANKLIN, M. Sc.,
Professor of Physics and Electrical Engineering.

G. W. BISSELL, M. E.,
Professor of Mechanical Engineering.

A. MARSTON, C E.,
Professor of Civil Engineering.

MISS CELIA FORD, A. B.,
Preceptress and Professor of French and German.

MISS MARIE L. CHAMBERS,
Professor of Elocution, Director of Music and Vocalist.

W. H. WYNN, PH. D., D. D.,
Professor of English Literature and History.

J. B. WEEMS, PH. D.,
Professor of Agricultural Chemistry.

W. E. HARRIMAN, B. Sc., M. D.,
Professor of Pathology, Histology and Therapeutics.

C. F. CURTISS, B. Ag.,
Assistant Professor of Agriculture.

W. B. NILES, D. V. M.,
Assistant Professor in Veterinary Science.

W. H. MEEKER, M. E.,
Assistant Professor of Mechanical Engineering.

S. W. BEYER, B. Sc., Ph. D.,
Assistant in Geology and Zoology.

N. E. HANSEN, B. Sc.,
Assistant Professor of Horticulture.

L. B. SPINNEY, B. M. E.,
Assistant Professor in Physics.

E. C. BOUTELLE, B. M. E.,
Instructor in Machine Shops.

MISS MINNIE ROBERTS, B. L.,
Assistant in Mathematics.

C. B. WEAVER, B. Sc.,
Assistant in Botany.

EMMA F. SIRRINE, B. S.,
Assistant in Botany.

JOS. S. CHAMBERLAIN, M. Sc ,
Assistant in Chemistry.

JULIA WENTCH, B. L.,
Assistant in Mathematics.

MISS ELMINA WILSON, B. C. E ,
Assistant in Civil Engineering.

A. R. WAKE, D. V. M ,
House Surgeon.

G. L. McKAY,
Instructor in Dairying and Cheese Making.

F. L. KENT, B. Ag.,
Assistant in Dairying.

C. D. REED, B. Ag.,
Assistant in Practical Agriculture.

E. C. POTTER,
Instructor in Carpentry.

MISS FLORA WILSON, B. L.,
Librarian.

MISS EMMA PAMMEL, B. L.,
Assistant in Chemistry.

LOLA PLACEWAY,
Assistant in Chemistry.

MISS GENEVIEVE WESTERMANN,
Instructor of Piano and Organ.

MISS CARRIE SCOTT,
Instructor in Violin and Theory.

Experiment Station Staff.

W. M. Beardshear, A. M , LL D., President.
James Wilson, Director.
C. F. Curtiss, B. S. A., Assistant Director.
J. B Weems, Ph. D., Chemist.
L. H. Pammel, M. Sc , Botanist,
Herbert Osborn, M Sc., Entomologist.
J. L. Budd, M. H., Horticulturist.
M. Stalker, M. Sc., V. S., Veterinarian.
W. B. Niles, D. V. M., Assistant Veterinarian.
N. E Hansen, B. Sc., Assistant Horticulturist.
W. H. Heileman, B. Sc , Assistant Chemist.
G. W. Carver, B. Sc., Assistant Botanist.
C. W. Mally, B. Sc., Assistant Entomologist.

HISTORICAL.

In 1858 the Legislature of Iowa passed an act to establish "A State Agricultural College and Model Farm," to be connected with the entire agricultural interests of the State; appointed a board of commissioners to buy a farm and erect a college building, and elected a board of trustees to select a faculty and organize a college. In 1859 a farm of six hundred and forty acres, situated near Ames, was purchased for the use of the college. This college and farm were entirely an agricultural institution.

In 1862 a bill was passed by Congress, entitled, "An act donating public lands to the several States and Territories, which may provide colleges for the benefit of Agriculture and the Mechanic Arts."

Section 1 of this act provides that for the support of such colleges there be granted "an amount of public land, to be apportioned to each State in quantity to equal thirty thousand acres for each Senator and Representative in Congress to which the States are respectively entitled by the apportionment under the census of 1860; provided that no mineral lands shall be selected or purchased under the privisions of this act "

Section 4 requires: 'That all moneys derived from the sale of the lands aforesaid by the States to which lands are apportioned, and from the sale of land script, hereinbefore provided for, shall constitute a perpetual fund, the capital of which shall remain forever undiminished (except as may be provided for in section fifth of this act),and the interest of which shall inviolably be apportioned by each State which may take and claim the benefit of this act, to the endowment, support and maintenance of at least one college, where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislature of the States may provide, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Section 5 says: "And be it further enacted, that the grant of land and landscript hereby authorized, shall be made on the following conditions, to which, as well as the provisions hereinbefore contained, the

previous assent of the several States shall be signified by legislative acts; first, if any portion of the fund, invested as provided by the foregoing section, or any portion of the interest thereon, shall, by any action or contingency, be diminished or lost, it shall be replaced by the State to which it belongs, so that the capital of the fund shall remain forever undiminished; and the annual interest shall be regularly applied without diminution to the purposes mentioned in the fourth section of this act, except that a sum not exceeding ten per centum upon the amount received by any State under the provisions of this act, may be expended for the purchase of land for sites or experimental farms, wherever authorized by the respective Legislatures of said States. Second, no portion of said fund nor the interest thereon shall be applied, directly or indirectly, under any pretense whatever, to the purchase, erection, preservation or repair of any building or buildings."

The General Assembly of Iowa, September 11, 1862, accepted the grant upon the conditions and under the restrictions contained in the act of Congress, and by so doing entered into a contract with the General Government to erect and keep in repair all buildings necessary for the use of the College. By this action of the General Assembly the College was changed from a purely agricultural institution into a College of Agriculture and Mechanic Arts, with the broad and liberal course of study outlined in the following paragraph.

In 1882 the General Assembly passed an act defining the course of study to be pursued as follows: Section 1. That section 1621 of the Code is hereby repealed and the following is enacted in lieu thereof. Section 2621. There shall be adopted and taught in the State Agricultural College a broad, liberal and practical course of study, in which the leading branches of learning shall relate to agriculture and the mechanic arts, and which shall also embrace such other branches of learning as will most practically and liberally educate the agricultural and industrial classes in the several pursuits and professions of life, including military tactics Section 2. That all acts, and parts of acts inconsistent with this act are hereby repealed

August 30th the following act was approved by President Harrison: "Be it enacted by the Senate and House of Representatives of the United States in Congress Assembled, that there shall be and hereby is, annually appropriated, out of any moneys in the treasury not otherwise appropriated, arising from the sales of public lands, to be paid as hereinafter provided, to each State and Territory for the more complete endowment and maintenance of colleges for the benefit of agriculture and the mechanic arts now established, or which may

hereafter be established, in accordance with an act of Congress approved July second, eighteen hundred and sixty-two, the sum of fifteen thousand dollars for the year ending June thirtieth, eighteen hundred and ninety, and an annual increase of the amount of such appropriation thereafter for ten years by an additional sum of one thousand dollars over the preceding year, and the annual amount to be paid thereafter to each State and Territory shall be twenty-five thousand dollars, to be applied only to instruction in agriculture, the mechanic arts, the English language and the various branches of mathematical, physical, natural and economic science, with special reference to their applications in the industries of life, and to facilities for such instruction."

The income of the College from National grants is therefore now more than $75,000 per annum, expended in instruction, experimentation and illustration in agriculture and the mechanic arts, and underlying and related science and literature.

All buildings are erected and all repairs thereon are made by the State of Iowa, the cost down to date being about $355,000.

The College was formally opened on the 17th of March, 1869.

Location.

The College occupies a delightful and healthful location, on high, rolling land, a mile and a half west of the town of Ames, which is at the junction or crossing of two lines of the Chicago & Northwestern Railway, in the center county (Story) of the State, and thirty-seven miles north of the city of Des Moines. The railroad facilities for reaching Ames from every part of the State are excellent. A steam motor railway makes frequent connection with Ames and the College daily.

Buildings, Grounds and Equipments.

Fourteen commodious buildings have been erected by the State at a total cost of about $400,000, for the exclusive use of the various departments of the College, besides the dwelling houses and buildings for farm stock, machinery and work.

The main College Building (see engraving, first page) is five stories high, including the basement, and is 158 feet long by 112 feet through the wings

This building is used for dormitory and boarding purposes, with recitation, society and reception rooms. About 250 students and teachers can be accommodated in this building.

All the rooms are heated by steam and lighted by electricity Pure spring water is supplied in all the stories of the building.

There are also two boarding cottages, brick buildings, affording rooms for ninety-four students; with dining room, kitchen and store rooms. The cottages are supplied with pure spring water, and lighted by electricity.

The other buildings are as follows, used for recitation and lecture rooms and laboratories:

Chemical and Physical Hall: Brick, three stories throughout; steam heat, water and gas. Laboratory outfit complete for 100 students in Chemistry; also nearly as many in Physics.

Botanical Hall; Brick, two stories, with outfits including about fifty compound microscopes, for individual laboratory work in Agriculture, Botany and Bacteriology.

Horticultural Hall: Frame, two stories, with propagating houses and grafting cellars, lecture room, museum and store rooms.

Veterinary Hospital: Brick, three stories, containing offices, dissecting rooms, and all modern appliances for the treatment of diseased animals.

Sanitary Hall: Frame, two stories; lower floor, office, kitchen and dining room for the hospital patients and rooms for convalescents; upper floor, seven rooms for care of any sick among the students.

Engineering Hall: Brick, four stories, including basement, and a large "L," containing machine shops, recitation rooms, drawing rooms, and outfit complete for the departments of Civil and Mechanical Engineering.

The Wood Shops: Frame, containing carpenter and pattern shops, with power and hand tools complete for wood work, and outfits of tools for individual work.

Power House: Brick, one story, contains engine and boiler furnishing power for the shops, and accommodates the experimental work of the course in Mechanical Engineering. The dynamos and motor power for electrical engineering are now in this building.

Domestic Economy Hall and South Hall: Brick, two stories, fitted up with apparatus and appliances for instruction in this branch of applied science.

The Office: Brick, for the use of trustees and faculty, and for offices of the president, secretary and treasurer.

The Experimental Station Building was erected in 1888, and is equipped at a cost of about nine thousand dollars, including library, apparatus and material.

Dwelling Houses: Ten comfortable dwelling houses on the grounds are occupied by professors' families, and several others by foremen and employes.

Other Buildings: Creamery, stables, barns, sheep and swine houses, seed houses, etc, sufficient for the requirements of the farm, are conveniently grouped just east of the College campus.

Morrill Hall is named in honor of the venerable U. S. Senator, Justin S. Morrill, the originator of the "Land Grant" for "Agricultural Colleges." The building cost about $35,000, including water supply, steam heat and electric light. It is of deep red brick, with stone foundation, and stone, brick and terra cotta trimmings interblended.

It stands on the high ground of the beautiful campus, north of and near the main building. It is for Chapel, capacity, 650; Library capacity, 50,000 volumes, the Museum, Lecture Rooms and Laboratories of the Department of Natural History and Geology.

Agricultural Hall was completed in the fall of 1893. It is a four story building. The lower stories are composed of stone from the state quarries at Anamosa, and the upper stories are brick. It is one of the most tasteful edifices on the campus, and cost about $40,000. It contains most excellent rooms for Horticulture, Agriculture, Agricultural Chemistry, Experiment Station work and Veterinary Medicine. It is finely lighted and heated and contains modern improvements.

New Woman's Building.

A most commodious and inviting building has been opened for the living of young women in the College. It is designed with choice architecture, composed of brick, roofed with slate and finished with taste. It occupies one of the most sightly locations on the campus, giving the most pleasing outlook to its occupants. It is provided with steam heat, electric lights, ample parlors, bath rooms and the most improved modern conveniences. It is neatly and tastefully furnished throughout. A large dining room is in connection with the building, with a capacity for eight hundred students. The department of Domestic Economy is also located in this building and open to all young women of the College. Rooms will be assigned to new students in the order of their application.

The College Grounds.

The College Domain includes about 900 acres. Of this about 120 acres are set apart for college grounds. These occupy the high land of the southwest part of the farm, and include the campus, shrubbery, plantations, young forestry plantations, the flower borders and gardens, with the beginnings of a botanical garden, and the surroundings of the professors' dwellings. Gravel drives, cement and gravel walks lead to all parts of the grounds and to the various buildings, and the true principles of landscape gardening have been so faithfully observed in the gardening and in the location of buildings and drives, as to make of the entire campus a large and beautiful park. The view of the surrounding country from the upper stories and towers of the Main Building is one of wide extent and great beauty.

Directions to Candidates and Students.

REQUIREMENTS FOR ADMISSION.

Students seeking admission to the College must be sixteen years of age.

Candidates for membership in the Freshman class must bring testimonials of good moral character and give evidence of a thorough knowledge of Orthography, English Grammar, Geography, Arithmetic, United States History, Human Physiology and (except in veterinary and agricultural courses) Algebra through simple equations.

Entrance examinations will be held at the College on the first and second day of each term. The first-class teacher's certificate of any county superintendent will be received in lieu of examination for Freshman standing, in the studies covered thereby.

THE PREPARATORY DEPARTMENT.

For Students From Country Homes. Nearly two-thirds of our most earnest students come from the country district schools. In these schools Algebra is not usually taught at all (unless as extra, by good will of the teacher or special vote of the directors), and Physiology not usually with sufficient thoroughness to meet our requirements for admission to Freshman standing. There seems to be a gap between these schools and this college.

The trustees and faculty have therefore decided to open a **preparatory department** the last half of each college year. From mid-July to mid-November each year instruction will be given in Algebra, Human Physiology, United States History, English Grammar and Military Tactics.

Requirements. For admission to this department the candidate must be 15 years of age and must give proof of a thorough knowledge of the branches taught in our common schools, especially complete Arithmetic and English Grammar.

This term of instruction will fit students who have faithfully learned what is taught in our common schools, and who are faithful in the work here, to take rank in the Freshman class the next spring term. Latin is an elective study in college, and is not required for admission to Freshman standing.

Certificates from the following schools will also be accepted for admission to Freshman standing, provided: (1) that they be based on examinations conducted within one year of presentation, and mark

not less than 85 on a scale of 100; (2) that they be signed by the Principal or Superintendent, and certify to the required amount and grade of work in each study; (3) that they be made out on blanks furnished on application to the President of the College. The right is, however, reserved of examining any candjdate in any study if occasion seems to require.

Other schools of equal grade will be added to this list on application with statement of course of study. The entire list will be revised each year.

LIST OF HIGH SCHOOLS.

Adel, Albia, Algona, Ames, Anamosa, Atlantic, Battle Creek, Belle Plaine, Bancroft, Belmond, Boone, Brooklyn, Burlington, Carroll, Cedar Falls, Cedar Rapids, Chariton, Charles City, Cherokee, Clarinda, Clarion, Clinton, Colfax, Columbus City, Corydon, Corning, Council Bluffs, Cresco, Creston, Davenport, Denison, Des Moines, DeWitt, Dunlap, Eldora, Emmetsburg, Estherville, Fairfield, Forest City, Ft. Dodge, Greene, Guthrie Center, Hamburg, Hampton, Harlan, Humboldt, Ida Grove, Independence, Iowa City, Iowa Falls, Jefferson, Keokuk, LaPorte, LeMars, Leon, Logan, Maquoketa, Manchester, Marengo, Marion, Marshalltown, Mason City, Monroe, Monticello, Montour, Missouri Valley, Mt. Pleasant, Muscatine, Nashua, Nevada, Newton, Odebolt, Onawa, Orange City, Osage, Osceola Oskaloosa, Ottumwa, Oxford, Red Oak, Rembeck, Rock Rapids, Rock well City, Sac City, Scranton, Sheldon, Sioux City, Steamboat Rock, Storm Lake, Stuart, Sumner, Tama City, Tipton, Toledo, Traer, Vinton, Villisca, Washington, Waterloo, Webster City, West Union, Wilton, Winterset.

LIST OF ACADEMIES AND OTHER SCHOOLS.

Albion Seminary, Algona Academy, Burlington Collegiate Institute, Decorah Institute, Denmark Academy, Epworth Seminary, Howe's Academy, Iowa City Academy, Northern Iowa Academy, Northwestern Classical Academy of Orange City, Springdale Seminary, and Washington Academy.

HOW TO ENTER THE COLLEGE.

Persons who desire to enter the College as new students should comply with the following directions:

1. Study carefully and comply with the "Requirements for Admission" on the two pages immediately preceding this. Then write to the President asking for a "Card of Inquiry."

2. On receiving the card write an answer opposite each question and mail the card to the President. If the answers you give accord with the "Requirements of Admission," a card of introduction will be sent you, which simply entitles you to admission on passing the examinations, or giving the required proof of proficiency.

3 Write to the Steward of the Agricultural College, inclosing $3.00 to retain a room, and ask for its number, dimensions, etc , that you may bring proper carpet and furniture, or purchase here. Read carefully pages following this.

4. When you arrive, at the opening of the term, present the card of introduction to the Steward, in his office in the Woman's Building; select your room if you have not done so according to 3, pay the rent, make your deposit and, without loss of time, show your receipt therefor to the President at his office, south of the Main Building. If you have not the proper certificate of proficiency in the studies required, you will have to secure a card of examination

5. Attend punctually every examination at the time and place indicated on that card. When all the examinations are completed, and your standings therein are marked on the card, return it to the President at his office. If you have passed the studies required with a standing of three or four (four being perfect), you will then sign the Student's Record Book and Contract, and secure a card of classification, which certifies your admission to the College and assigns you to your proper classes.

6. Present the card of classification to each of the teachers having charge of the classes to which you are assigned, and attend thereafter every recitation of the term.

THE CLASSIFICATION OF STUDENTS.

A student who fails to secure the required pass-mark in any study must make up that study before it is taken by the next College class, or classify *back* with the class in this study. If his mark is below 2.75 on a scale of 4 00 he will not be permitted to make up the work by himself, but *must take it over again with the next class.*

N. B. To enable students to make up back studies, such examinations as may be necessary will be held during the first full calendar week of each term. At the beginning of the year in February, no student can classify for promotion with his class until he has passed a satisfactory examination on all studies but one "five hour study" of the preceding year, and that study must be passed by the end of the first week *of the next term.*

STUDENTS' EXPENSES AND EQUIPMENT.

No charge is made for tuition to Iowa students. To those who come from outside the state $30.00 tuition per year will be charged, unless remitted to worthy students by special vote of trustees, on recommendation of the faculty

For board, heating, lighting, cleaning and care of the college buildings students pay less than the items actually cost the institution. Injury to college property, of whatever sort, is charged to the author, when known; otherwise to the section, or the entire body of students, as may seem just in the given case.

Students who board in any of the college buildings, **furnish their own bedding and all furniture for their rooms**, excepting bedsteads, washstands, tables and wardrobes.

Each student will provide himself with the following articles:

1 Chair.
1 Looking-glass.
1 Wash-basin and ewer.
1 Slop-pail.
6 Towels.
4 Table napkins.
6 Sheets—for single bed.
3 Pillow-cases.
Pillow and mattress as may be desired.
Bed clothes (blankets or comfortables) as required.

Students are earnestly advised to bring from home, carpets, etc, **to make their rooms comfortable and cheerful.** Male students in the two lower classes, not physically disabled, are required by law to take the military drill, and purchase uniforms therefor. "Physical disability" must be certified to by our surgeon, Dr. Harriman, on examination.

The current expenses of students during the year 1895, were about as follows:

In the Main College Building and Creamery

Board, per week	$2 25
Lighting, heating and incidentals, per week	85
Room rent, per term	3 00
*Hospital fees, per term	1 25

In the Cottages

Board, per week	$2 25
Fuel, lighting and incidentals, per week	70
Room rent, per term	3 00

*Hospital fees, per term 1 25

For day students -

Janitor's fees, per term of seventeen weeks $5 00

As security for the payment of the bills against him, each student at the opening of the term, is required to make deposits with the treasurer, as follows:

On board account in main building (for those who board there)	$20 00
On board account in boarding halls (for those who board there)	15 00
On room and furniture account	5 00
On general breakage and damage account	1 00

These deposits will be returned on final settlement at the close of term.

All bills for each month must, without fail, be settled at the treasurer's office on the second Saturday of the month following.

The dining room will be opened on the evening preceding the respective days on which the spring and fall terms commence. *No allowance on board bills is made for absence.* Students and others who bring guests to their tables are required to purchase meal tickets. All students are required to board and room in Main Building, or in one of the cottages, or dormitory, except when permission to board elsewhere has been for good reasons granted by vote of the faculty, and approved by the president

Text books and stationery may be purchased at the College Book Store, at about twenty-five per cent below the average retail prices, that is, *actual cost to the College.*

MANUAL LABOR - SHOP, LABORATORY AND FIELD PRACTICE.

The following regulations in regard to manual labor have been adopted by the board of trustees:

1. The manual labor of students is divided into two kinds, viz.: Uninstructive labor, which shall be paid for in money, and instructive labor, which shall be compensated by the instruction given and the skill acquired

2. Uninstructive labor shall comprise all the operations in the workshop, the garden, upon the farm and elsewhere, in which the work done accrues to the benefit of the College and not to that of the student. Instructive labors shall embrace all those operations in the work shop, museum, laboratories, experimental kitchen, upon the

*NOTE.—A commodious and secluded hospital building is provided, and this hospital fee of one dollar and twenty-five cents insures to each free nursing and medical attendance in case of accident or sickness. This gives the means also of checking and controlling measles, mumps and other contagious diseases, should theya ppear. The hospital has proved tobe a great blessing to the students, and the insurance is placed at actual cost.

farm and in the garden, in which the sole purpose is the acquisition of knowledge and skill.

3. Students shall engage in instructive labor in the presence and under the instruction of the professor in charge, according to the statement made in each of the courses of study.

The compensated labor furnished by the Departments of Agriculture, Veterinary Science and of Engineering, is given by each to its own students, and is eagerly sought The "details" of compensated labor supplied by the needs of the various departments are given to the most faithful and meritorious students in each department Uninstructive labor is paid for according to its value to the College, but no student should expect to pay the main part of his expenses by labor while here. The College cannot furnish the work, and even if it could, the student's time is *chiefly needed for study.* Still, many worthy and industrious students pay a considerable part of their expenses by labor, over $3,000 being paid out by the College thus each year to students and post-graduate assistants.

GOVERNMENT.

The relations of our College buildings, and the nature of the exercises, complicated as they are by laboratory work, shop practice and labor, make order, punctuality and systematic effort indispensable. This institution, therefore, offers no inducements to the idler or self-indulgent. All who are too independent to submit to needful authority, or too reckless to accept wholesome restraint, are not advised to come. The discipline of the College is confined mainly to sending away promptly those who prove on fair trial to be of the said class

The use of tobacco by studen s on the College premises is forbidden. The presence of ladies in the various rooms and halls renders this imperative, to say nothing of other considerations. Those who are already so addicted to its use that they cannnot cheerfully submit to this regulation are advised not to come. Of course the use of intoxicating beverages and of profane and obscene language is forbidden.

PUBLIC WORSHIP.

Officers and students gather daily in the chapel at 6:55 p m. for public worship, except on Wednesday, when the time from 4:00 to 5:30 p. m. is needed for military drill and dress parade, and on Saturday, when there are no college exercises. On Sunday morning at 10:45 a discourse is given in the chapel by a clergyman invited for the occasion. The object of these services is to emphasize and

enforce the principles of morality and of the Christian religion. Being a state institution we give the utmost freedom to all creeds and forms of belief, avoiding the controversies of sectarianism.

The faculty requires on Sunday such conduct and decorum in and about the College buildings as befit the observance of the Sabbath.

RELIGIOUS ASSOCIATIONS.

The Young Men's and Young Women's Christian Associations of the College are voluntary organizations composed of students and members of the faculty. Their membership is large. The Sunday School, Bible classes and prayer meetings are under their direction, and are well attended and profitable. This voluntary Christian influence in the College is strong and healthful.

LITERARY AND TECHNICAL SOCIETIES.

Six excellent Literary Societies hold their meetings each Saturday evening, and serve to supplement the literary work of the College. On that ground they are recognized by the College, given rooms and an entire evening free from study or other exercises. All students are advised to join one of these societies.

There is a Science Club, an Engineering Society, a Veterinary Society, an Economic Association, and an Agricultural and Horticultural Association, in the exercises of which members of the faculty and students interested take part.

COURSES OF STUDY.

Eight courses of study, leading to the following degrees, are offered:

1. The course in Agriculture embraces four years and leads to the degree of Bachelor of Agriculture.

2. The course in Veterinary Science of three years leads to the degree of Doctor of Veterinary Medicine

3. The course in Mechanical Engineering of four years leads to the degree of Bachelor of Mechanical Engineering.

4. The course in Civil Engineering of four years leads to the degree of Bachelor of Civil Engineering.

5. The course in Electrical Engineering of four years leads to the degree of Bachelor of Science in Electrical Engineering.

6. The course in Mining Engineering of four years leads to the degree of Bachelor of Science in Mining Engineering.

7 The course in Science as related to the Industries of four years leads to the degree of Bachelor of Science.

8. The course for Ladies of four years leads to the degree of Bachelor of Letters. Ladies may take any other course desired.

ADDITIONAL COURSES IN AGRICULTURE AND DAIRYING.

For the short courses in Agriculture and Dairying, certificates properly indicating the completion of certain studies will be given.

SPECIAL LINES OF STUDY

Any person of mature age and good moral character, who desires to pursue studies in any department of instruction of the College, and who is not a candidate for a degree, will, upon application to the president, be admitted on the following conditions: (1) He must meet the requirements for admission to the Freshman class, and pass such special examinations as the professor in charge of the department selected shall deem essential to a profitable pursuit of the work. (2). He shall confine his work strictly to the line of study chosen at the time of admission, and shall take enough class work, laboratory and other practice equivalent to work required of regularly classified students. (3). He shall submit to the same requirements in daily recitations and examinations, with students in the regular courses.

Students who have pursued thus a special line of study in the Institution, will, upon application to the faculty, be granted the College Certificate showing their standing in such studies.

GRADUATING THESIS.

The subjects of Theses shall be selected under direction of the professor in whose department they are written, and submitted to the Thesis Committee, with signed approval of the Professor, on or before the first Monday in April.

It is expected that each thesis shall represent an amount of work equivalent to at least one exercise per week through the senior year; that it shall show the result of the student's personal study or investigation and be throughout original in matter and treatment so far as the nature of the subject will permit; that it shall be prepared under the supervision of the professor in charge, the student making frequent reports of progress and having an outline of matter ready for approval by the first week of the last term.

The thesis, ready for examination and marking, with its specific title and the written approval of the professor in charge, shall be presented to the Thesis Committee at a date fixed by the Committee during the four weeks preceding the Commencement Day.

A type-written copy, prepared according to the rules held by the librarian, must be deposited in the library before the student can be recommended for graduation.

The Course in Agriculture.

I. THE FOUR YEAR COURSE IN AGRICULTURE.

FRESHMAN YEAR.

FIRST TERM.	SECOND TERM.
Algebra, Elementary—5.	Algebra, Advanced 3.
Elocution 1.	Botany—2.
English Language 5.	Economic Entomology - 2.
History 3, or	Elocution 1.
Bookkeeping 5	History 2. If taken first term.
Livestock 2. (See note A.)	Horticulture 3.
Military Drill 2.	Drawing 1.
Shop Work- 4 hours	Live Stock 2. (See note B.)
Sight Singing 1.	Military Drill 2
	Rhetoric 3
	Library Work 1.
	Sight Singing 1.

NOTE A. *Live Stock.* First term Freshman year includes history, development, characteristics, standard points, utility, features of resemblance and difference, adaptability to climatic conditions, lessons on judging, care, selection and management of each of the leading breeds of horses and sheep. (Seventeen breeds of horses, thirteen of sheep.)

NOTE B. *Live Stock* Second term. Freshman year includes the history, development, characteristics, standard points, utility, features of resemblance and difference, adaptability to climatic conditions, lessons on judging, care, selection and management of each of the leading breeds of cattle and hogs. (Eighteen breeds of cattle and fourteen of hogs). Representative animals of most of the above breeds are brought before the class for demonstration and judging.

SOPHOMORE YEAR.

FIRST TERM.	SECOND TERM.
Botany; Vegetable Physiology -3.	Botany, Cryptogamic 3.
Laboratory Practice 1.	Laboratory Practice —1.
Horticulture -2.	Ag. Chemistry 5.
Military Drill 2	Laboratory Practice 3.
Physics, Agricultural--5.	Military Drill--2
Practical Agriculture 5. (See note C.)	Practical Agriculture 5. See note D.)
Geometry 5.	Zoology 3.
English 4*.	Laboratory Practice 1.

NOTE C *Practical Agriculture.* First term, Sophomore year, includes climate management of manures, cultivation, economic division of farm work, planting, history of farm crops cultivated in Iowa, field observations

NOTE D. *Practical Agriculture.* Second term, Sophomore year, includes growth of crops, rotations, minerals in plant economy, harvesting, ensilage, irrigation, sewage, pastures, field observations, etc.

†JUNIOR YEAR.

FIRST TERM -REQUIRED.	SECOND TERM - REQUIRED.
Trignometry and Surveying -5.	Botany, applied —1.
Botany, Bacteriology —1.	Laboratory Practice -1.
Laboratory Practice—1.	Chemistry, Agricultural - 2.
Chemistry, Agricultural—2.	Laboratory Practice - 1.
Laboratory Practice 2.	Dairying—1.
Elocution—1.	Laboratory Practice—2.
Heredity, Principles of 2. (See note E).	One Oration.
	Horticulture 5.

ELECTIVE.	ELECTIVE.
Law, Commercial 2.	Literature, English—5.
Literature, English 3.	Military Science and Drill (optional) -1.
Military Science and Drill	Economic Science —5.
Zoology—3,	Entomology—5.
Laboratory Practice—2.	Latin or German—5.
Latin or German -5.	Geometry Analytic- -5.

*English in spring term, Sophomore Year, is required where Geometry was taken in fall term Freshman

†In the Junior year the student is permitted to select from the list of each term a number of studies aggregating not less than sixteen nor more than twenty exercises each week, but no agricultural study can be omitted.

NOTE E. *Stock Breeding* First term, Junior year, includes breeding as an art, heredity, atavism, laws of correlation, variation and fecundity, in and in breeding, cross breeding, influence of parents and previous breeding, sex, pedigree, form, selection, period of gestation.

NOTES CONCERNING DAIRYING IN THE FOUR YEAR COURSE.

Dairying. Second term, Junior year. Seven hours per week are spent in the practical work in the Dairy building, and one lecture is given per week. During this term the student is expected to become familiar with the manner in which a commercial dairy is managed. He learns how to weigh the milk brought in by patrons and preserve composite samples, how to analyze the latter by the Babcock method, and thus determine the price each patron should receive for his milk, how to manage the separators, ripen the cream, churn, work and salt the butter and prepare it for the market. The one hour per week in the class room is devoted to the study of the principles underlying the practical work done in the dairy building

*SENIOR YEAR.

FIRST TERM—REQUIRED.

Bacteriology in Milk 2.
Chemistry, Agriculture—2.
Laboratory Practice 1.
Dairying—2.
Laboratory—1.
One Oration—1.
Farm Drainage—2. (See note F).
Seeds and Grasses—2.

SECOND TERM REQUIRED.

Animal Nutrition—(See note G.)
Dairying—5.
Horticulture 3.
Thesis (Required).
Elocution—2

ELECTIVE.

Geology--5.
History, Development of U. S. 3.
Psychology 5.
Anatomy of Domestic Animals 5
Additional Dairying—4
Additional Chemistry—4.
Calculus - 5.
Latin or German—5.
Military Science and Drill 1.

ELECTIVE.

Evolution of Plants—1.
Evolution of Animals 1.
Vegetable Pathology—2.
History of Civilization--5.
Science of Morals—3.
Veterinary Medicine—5.

*In the Senior year the student is permitted to select from the list of each term a number of studies aggregating not less than sixteen nor more than twenty exercises each week, but no agricultural study can be omitted.

NOTE F. *Farm Drainage.* First term, Senior year, includes practical effects of drainage; land needing drainage; preliminary and topographical survey, involving the different problems of drainage engineering; map drawing; calculating depths of drains and capacity of pipes; laying the drains and preserving them intact.

NOTE G. *Animal Nutrition.* Second term, Senior year, includes the discussion of the anatomy and physiology of the digestive system, the process of nutrition, theory of rations, sanitation of feeds and hygiene of the farm

NOTE H. *Dairying.* In the first term, Senior year, cheese making is taken up. Two lectures are given per week in which the principles of the Chedder system of making cheese are thoroughly discussed. The practical application of the related sciences is also pointed out. During the latter part of the term the methods of manufacturing some of the most valuable fancy brands are studied Students are required to devote six hours one day each week to the practical work of manufacturing the different kinds of cheese in the dairy building.

NOTE I. *Dairying.* In the second term, Senior year, the study of the different brands of cheese is completed early in the term and the remainder of the time is devoted to the study of milk, separation of the cream by the gravity system under different conditions, milk from cows of different breeds and different cows of the same breed, and the changes which it undergoes under changed conditions, both methods of handling the milk, cream and butter in the private dairy, etc., etc. Two lectures are given per week and nine hours laboratory work per week are required by each student It is expected that the student will spend the greater part of his time devoted to laboratory work during the latter half of the term in original investigations and experimental work.

THE TWO YEAR COURSE IN AGRICULTURE.

This course is arranged for those who have not the time or means to devote four years to college work, but who desire a somewhat extended course of agricultural instruction It includes only such studies of the four year course as bear directly upon farming. Requirements for admission are the same as the long course, with the exception of algebra.

FIRST YEAR.

FIRST TERM.	SECOND TERM.
Live Stock and Field Lectures--4.	Botany, Drawing, Entomology } —5
Agricultural Physics—3.	Horticulture—3.
Anatomy of Domestic Animals—5.	Field Practice -1.
English Language 5.	Live Stock and Field Lectures—4.
Shop Work - 1.	Veterinary Medicine—5.
Sight Singing—1.	Dairying—2.
	Sight Singing--1.

SECOND YEAR.

FIRST TERM.	SECOND TERM.
Heredity, Principles of - 2.	Animal and Vegetable Nutrition—5.
Farm Drainage 2.	Agricultural Chemistry 5.
Botany 4.	Zoology 4.
Dairying 3.	
Horticulture--2.	
Business Law- 2.	

THE ONE YEAR COURSE IN DAIRYING.

To give those who desire it an opportunity to acquire an intimate knowledge of practical dairy methods and the underlying principles, as well as the sciences related thereto, the one year course in dairying is offered. This course runs through one college year, beginning in February and ending in November, with an intermission of one month in mid-summer. Students completing this course will receive certificates Following is the course of study pursued:

FIRST TERM.	SECOND TERM.
Dairy Laboratory, 7 hrs. per day.	Dairy Laboratory, 7 hrs. per day.
Dairy Lectures, 40 per term.	Dairy Lectures, 32 per term.
Dairy Machinery, 35 per term.	Dairy Laboratory, 5 hrs. per week.
Breeding and Feeding, 30 lect'rs.	Bacteriology, of Milk, 16 lectures.
Bookkeeping, 30 lectures.	Dairy Stock, 16 lectures.
Dairy Chemistry—Laboratory 20	Original Experimental Work.

THE SUMMER SCHOOLS IN DAIRYING.

While we earnestly advise those who expect to work in dairy lines either on the farm or in the creamery or factory to take the one year course in Dairying as outlined above, we realize that there are many who for various reasons are unable to do this Believing that a state institution should offer every possible encouragement to those who desire to fit themselves to do their chosen work in the best manner, two Summer Schools in Dairying are thrown open to students. The first of these schools begins with the regular college year in February and continues sixteen weeks. The second begins with the second regular college term in July and continues sixteen weeks. The same studies are pursued during these terms and are as follows:

Work in Dairy Buildings, six half days per week.
Dairy Lectures, fifty per term.
Breeding and Feeding, thirty lectures per term.
Chemical Laboratory, three hours each week.
Bacteriology of Milk, sixteen lectures per term.
Bookkeeping, thirty-two lectures per term.

THE WINTER SCHOOL IN AGRICULTURE.

This school is designed to meet the wants of that large class of progressive farmers and farmers' sons who appreciate the need of a better understanding of the principles involved in their daily work, but who cannot leave the farm during the summer months for the purpose of taking a course of study. It is not expected that it will take the place of the thorough and more extended training of the four year course, but it furnishes an intensely practical course which may be of great benefit to those for whom it is established. There are no requirements for admission. This course begins January 2d. The course of study embraces the following branches:

Veterinary Science, twenty lectures.
Live Stock, twenty lectures.
Dairying, twenty lectures
Bookkeeping, twenty lectures.
Agricultural Chemistry—laboratory, 20.
Bacteriology, twenty lectures
Stock Feeding and Breeding -20.
Horticulture, twenty lectures.
Shop Work, four hours each week.
Economic Entomology, ten lectures.

THE WINTER SCHOOL IN DAIRYING.

This school is conducted for the benefit of those who wish to make a special study of dairying and the sciences closely related to it, and who are not able to attend during either of the summer dairy schools. It begins January 2d and continues eight weeks. It is largely attended by men who have had practical experience in dairy work, but feel the need of a more thorough knowledge of the principles which underlie the science of dairying and the most improved methods. Being held during the winter a great many men who have charge of creameries and cheese factories during the summer are able to attend, and those who have done so have expressed themselves as being greatly benefitted thereby. The course of study outlined is as follows:

Work in Dairy Building, six half days per week.
Dairy Class Work, sixty lectures.
Dairy Chemistry—laboratory, twenty.
Bacteriology of Milk, ten lectures.
Bookkeeping, twenty lectures.

Course in Veterinary Science.

FRESHMAN YEAR.

FIRST TERM.

Anatomy of Domestic Animals-5.
Dissections and Clinics, 4 afternoons per week
English Language—5.
Histology—2.
Laboratory Practice 1
Principles of Heredity--2.
Military Drill 2.
Sight Singing 1.

SECOND TERM.

Anatomy of Domestic Animals—2.
Elementary Botany—2.
Dissections and Clinics, 3 afternoons per week.
Veterinary Medicine--5.
Physiology—4.
Zoology - 2.
Military Drill -2.
Library Work -1.
Sight Singing -1.

JUNIOR YEAR.

FIRST TERM.

Botany, Pharmaceutical 1.
Laboratory Practice 1.
Chemistry, General 3.
Laboratory Practice 2.
Dissections and Clinics, 2 afternoons per week.
Materia Medica 4.
Physiology 3.
Zoology--2.
Laboratory--1.
Military Drill--2.

SECOND TERM.

Anatomy of Domestic Animals 2
Chemistry - 3.
Laboratory Practice -3.
Clinics, 4 afternoons per week.
Veterinary Medicine -3.
Ophthalmology 1.
Pathology, General—3
Laboratory Practice—1.
Animal Parasites--2.
Military Drill--2.
One Oration--1.

SENIOR YEAR.

FIRST TERM.

Botany, Bacteriology--1.
Laboratory Practice--1.
Chemistry, General--3.
Pathology, Comparative--3.
(After 5th week)
Therapeutics--2.
Veterinary Medicine, Principles and Practice of--4.
Operative Surgery, principles of-2.
Clinics, 5 afternoons per week.
Thesis begun
One Oration--1.

SECOND TERM.

Anatomy of Domestic Animals--2.
Veterinary Surgery, Principles and Practice of- 3
Obstetrics—2.
Opthalmology--1.
Therapeutics, Surgical--2.
Clinics—5.
Examination for Soundness—1.
Shoeing, Principles of—1.
Thesis, finished 4 weeks before close of term.
Animal and Vegetable Nutrition-5.

Course in Mechanical Engineering.

FRESHMAN YEAR.

FIRST TERM.	SECOND TERM.
Algebra, Advanced--5.	Geometry -5.
English Language -5.	Algebra, Advanced--3.
History- 3.	Rhetoric—3.
Free-hand Drawing--2.	Mechanical Drawing -2.
Shop Work 8 hours.	Shop Work—8 hours.
Military Drill 2.	Military Drill -2.
Elocution--1.	Library Work--1.
Sight Singing--1.	History--2.
	Sight Singing--1.

SOPHOMORE YEAR.

FIRST TERM.	SECOND TERM.
Physics—5.	Analytical Geometry--5.
Trigonometry—5	Chemistry—3.
Descriptive Geometry--5.	Laboratory--2.
Mechanical Drawing--2	Physics—3.
Shop Work -8 hours.	Mechanical Drawing--1.
Military Drill--2.	Shop Work--8 hours.
	Military Drill—2.

JUNIOR YEAR

FIRST TERM.	SECOND TERM.
Calculus--5.	Economic Science—5.
Mechanics--4.	Mechanics—4.
Chemistry -3.	Materials of Construction—3.
Laboratory —2.	Physical Laboratory—1.
Mechanical Drawing—2	Shop Work—2.
Shop Work—8.	Mechanical Laboratory—1.
Military Science and Drill (optional)--1.	Mechanical Drawing—1.
	Military Science and Drill (optional)—1.
	One Oration (required)—1.

SENIOR YEAR.

FIRST TERM.	SECOND TERM.
Machine Design—3.	Electricity—5.
Hydraulics—4.	Laboratory—2.
Mechanical Laboratory—2.	Thesis—3.
Mechanical Drawing—2.	Machine Design—3.
Steam Engine—3.	Mechanical Drawing—2.
Shop Work—8.	Mechanical Laboratory—1.
Military Science and Drill (optional)—1.	Military Science and Drill (elective)—1.
One Oration (required)—1.	
Selected or Special Work—2-5.	

NOTE—An illustrated pamphlet of the engineering departments will be sent on application.

The Course in Civil Engineering.

FRESHMAN YEAR.

FIRST TERM	SECOND TERM.
Algebra, Advanced—5.	Geometry—5.
Drawing, Freehand—2.	Algebra, Advanced—3.
Elocution—1.	Drawing, Mechanical—2.
English Language—5.	Library Work—1.
History—5.	Rhetoric—3.
Military Drill—2.	Military Drill—2.
Sight Singing—1.	Botany, Systematic—1.
	Structure of Woods—1.
	Lettering—1.
	Sight Singing—1

SOPHOMORE YEAR.

FIRST TERM.	SECOND TERM.
Trigonometry—5.	Analytical Geometry—5.
Des. Geometry { Recitations—4. Drawing—1.	Physics, Heat—3.
	Chemistry—3.
Physics, Mechanics—5.	Laboratory Practice—2.
Surveying { Recitations—2. Field Practice—2.	Surveying { Recitations—2. Field Practice—2.
Military Drill—2.	Military Drill—2.
	Drawing, Tinting and Shading—1.

JUNIOR YEAR.

FIRST TERM.	SECOND TERM.
Calculus—5.	Mechanics—4.
Mechanics—4.	Economic Science—5.
Chemistry—3.	Physics, Electricity and Magnetism
Laboratory Practice—2.	—5.
R. R. Surveying { Recitations—2. F'd Practice—2.	R. R. Surveying { Recitations—2. F'd Practice—3.
Shades, Shadows and Perspective { Recitations—1. Drawing—1.	One Oration—1.
	Engineering, Laboratory—1.
Military Science and Drill(opt)—1.	Military Science and Drill(opt.)—1.

SENIOR YEAR.

FIRST TERM.	SECOND TERM.
Structures, Bridge and Roof—4.	Spherical Astronomy—3,
Hydraulics—4.	Structures, Bridge and Roof—4.
Botany, Decay and Preservation	Designing—3.
of Timber—1.	Masonry Structures and Founda-
{ General Geology, 8 weeks—5.	tions—4.
{ Economic Geology, 8 weeks—3.	Hydraulic Engineering—2.
or Psycology, or French—5.	Thesis—3.
Physical Laboratory—1.	Military Science and Drill(opt.)—1.
Stereotomy and Theory of Arch—2	French (opt.)—5.
Sanitary Engineering—2.	
Military Science and Drill(opt.)—2.	
One Oration—1.	
Thesis, begun.	

The Course in Electrical Engineering

FRESHMAN YEAR.

FIRST TERM.	SECOND TERM.
Algebra, Advanced—5.	Algebra, Advanced—3.
Elocution—1.	Geometry- 5.
English Language—5.	History—2.
History—3.	Mechanical Drawing—2.
Freehand Drawing—2.	Military Drill—2
Military Drill—2.	Rhetoric—3.
Shop Work—8 hours.	Library Work -1.
Sight Singing—1.	Shop Work—8 hours.
	Sight Singing 1.

SOPHOMORE YEAR.

FIRST TERM.	SECOND TERM.
Descriptive Geometry 4.	Analytical Geometry—5.
Mechanical Drawing 2.	Chemistry—3.
Military Drill -2.	Laboratory Practice—2.
Physics, Mechanics- 5.	Mechanical Drawing—1.
Trignometry, Plane and Spherical—5	Military Drill--2.
Shop Work--8 hours.	Physics, Heat 3.
	Shop Work 8 hours.

JUNIOR YEAR.

FIRST TERM.	SECOND TERM.
Chemistry--3.	Electricity and Magnetism--5.
Laboratory Practice—2.	Laboratory Practice—2.
Calculus—5.	Economic Science--5.
Mechanics—4.	Military Science and Drill (opt.)-1.
Military Science and Drill (optional)—1.	Mechanics—4.
Mechanical Drawing -2.	Mechanical Drawing—1.
Physical Laboratory--2.	Mechanical Laboratory—1.
	One Oration—1.

SENIOR YEAR.

FIRST TERM.

Dynamo Electric Machinery--4
Laboratory Practice--2.
Designing--1.
Machine Design—3.
Mechanical Laboratory--2
Military Science and Drill (optional) -1.
Steam Engine—2.
Selected or Special Work--2-5.
One Oration -1.

SECOND TERM.

Applied Electricity--4.
Physical Laboratory--4.
Machine Design--
Electrical Designing--2.
Military Drill (optional)—1.
Thesis—3.
Selected or Special—2-5.

The Course in Mining Engineering.

FRESHMAN YEAR.

FIRST TERM.

Algebra, Advanced 5.
Drawing--2.
Elocution—1.
English Language 5.
German—5.
Military Drill—2.
Shop Work - 8 hours.
Sight Singing—1.

SECOND TERM.

Algebra, Advanced 3.
Drawing, Mechanical 2.
Geometry 5.
German 5.
Library Work 1.
Military Drill—2.
Shop Work—8 hours.
Sight Singing—1.

SOPHOMORE YEAR.

FIRST TERM.

Descriptive Geometry—5.
Land Surveying—2.
Fires—1.
Military Drill—2.
Physics, Mechanics 5.
Trigonometry--5.
Shop Work- 2.

SECOND TERM.

Analytical Geometry—5.
Chemistry.
Laboratory Practice—3.
Military Drill--2.
Physics, Heat—3.
Serveying, Mining and Topographical 3.

JUNIOR YEAR.

FIRST TERM.

Analytical Mechanics--4.
Chemistry—2.
Laboratory Practice--3.
Calculus—5.
Mineralogy, Crystallography—3.
Laboratory Practice—1.
Mining—2.
Military Drill (optional)--1.

SECOND TERM.

Electricity and Magnetism—5.
Chemistry, Blow-pipe Analysis—1.
Laboratory Practice--2.
Mechanics—4.
Mineralogy—2.
Laboratory Practice—2.
Mining—4.
Military Drill (optional)—1.
One Oration--1.

SENIOR YEAR.

FIRST TERM.

Dynamo Machinery—4.
Laboratory Practice—2.
Geology—5.
Hydraulics—4.
Metallurgy and Assayings -1
Laboratory Practice—2.
Mining—2.
Steam Engine—2.
Military Drill (optional)—1.
Thesis, begun
One Oration--1.

SECOND TERM.

Engineering Laboratory—4.
Economic Geology and Petrography—3.
Laboratory Practice—2.
Materials for Construction—
Metallurgy and Assayings—1.
Laboratory Practice—2.
Tunneling—3.
Military Drill (optional)—1.
Thesis—2.

The Course in Sciences Related to the Industries

FRESHMAN YEAR.

FIRST TERM.

Algebra, Advanced—5.
Drawing—2.
Elocution—1.
English Language—5.
History or Latin or German—5.
(Latin or German, if chosen, must continue throughout the year).
Military Drill—2.
Sight Singing—1.

SECOND TERM.

Botany, Elementary—2.
Elocution—1.
Entomology, Economic—2.
Geometry—5.
Military Drill--2.
Rhetoric—2.
Latin or German—5.
Library Work—1.
Sight Singing—1.

SOPHOMORE YEAR.

FIRST TERM.	SECOND TERM.
Botany, Systematic—1.	Botany, Cryptogamic—3.
Physiological—2.	Laboratory Practice—1.
Laboratory Practice—1.	Chemistry, General—5.
English or Latin or German—4.	Laboratory Practice—3.
Military Drill—2.	Geometry, Analytic—5.*
Surveying, eight weeks—5.	Zoology—3.
Field Practice—1.	Laboratory Practice—1
Trigonometry, plane, nine weeks—5.	One Oration.
One Essay.	

†JUNIOR YEAR.

FIRST TERM.	SECOND TERM.
Botany, Bacteriology—1.	Botany, Microscopical Examinations of Foods—1.
Laboratory Practice—1.	Laboratory Practice—1.
Calculus—5.	Chemistry, Organic—3.
Chemistry, Qualitative—2.	Laboratory Practice—1.
Laboratory Practice—3.	Economic Science—5.
Elocution—1.	Elocution—1.
Law, Commercial—2.	Entomology—5.
Literature, English—3.	Literature, English—5.
Military Science and Drill—1.	Military Science and Drill—1.
Physics, Light and Sound—3.	Physics, Electricity and Magnetism—4.
Laboratory Practice—1.	Laboratory Practice—1.
Zoology—3	Physiology—4.
Laboratory Practice—2.	One Oration (required)—1.
Physical Laboratory—1.	Photography—1,**
	Laboratory Practice—1.

*Choice between Analytical Geometry and Cryptogamic Botany.

**Only on recommendation of the professors in charge of departments.

†SENIOR YEAR.

FIRST TERM.	SECOND TERM.
Anatomy of Domestic Animals.	Astronomy 5.
Economic Science -1.	Elocution 1.
Elocution—1.	Geology -3.
Geology, General, nine weeks - 5.	History of Civilization -5.
Economic Geology, 8 weeks 3.	Medicine and Surgery, Veterinary - 5.
History and Development of the United States--3.	Military Science and Drill 1.
Military Science and Drill 1.	Pathology, Vegetable -2.
Psychology 5.	Science of Morals—3.
Bacteriology — 2, or Vegetable Physiology—2.***	Evolution of Plants—1.
Thesis (required) 1.	Evolution of Animals 1.
One Oration (required)—1.	Thesis (required, 1.

Course for Ladies.

FRESHMAN YEAR.

FIRST TERM.	SECOND TERM.
Algebra, Advanced—5.	Botany, Elementary—2.
Drawing—2.	Domestic Economy—1.
Elocution--1.	Laboratory Practice—1.
English Language—5.	Elocution 1.
Sight Singing—1.	Entomology, (optional)—2.
German or Latin to be continued through the Sophomore year as now chosen) 5.	German or Latin 5.
	Geometry—5.
	Horticulture (optional)—2.
	Rhetoric—3.
	Library Work 1.
	Sight Singing—1.

***Students will not be allowed to select both

†In the Junior year the student is permitted to select from the list for each term a number of studies aggregating not less than sixteen nor more than twenty exercises each week In the Senior year the student is permitted to select from the list for each term of the Junior or Senior Years a number of studies aggregating not less than sixteen nor more than twenty exercises per week.

Students having omitted Analytical Geometry or Botany in second term of the Sophomore year may take such study in Junior or Senior year.

SOPHOMORE YEAR.

FIRST TERM.

Domestic Economy 1.
Laboratory Practice—1.
German or Latin 4.
History—2.
One Essay.
Choice of any two of the following Sciences:
Botany, Systematic 1.
Physiological 2.
Laboratory Practice 1.
Horticulture—2.
Physics, Mechanics and Heat 5.
Trigonometry (nine weeks) 5.

SECOND TERM.

Elocution—2.
German or Latin 4.
History 2.
One Essay.
Choice of not less than eight exercises each week of the following Sciences:
Botany 3.
Laboratory Practice 1.
Chemistry, General 5,
Laboratory Practice—3.
Geometry, Analytic 5.
Zoology 3.
Laboratory Practice 1

JUNIOR YEAR.

FIRST TERM.

Botany, Bacteriology 1.
Laboratory Practice—1.
Calculus 5.
Chemistry, Qualitative—2.
Laboratory Practice 3.
Elocution—2.
French 5.
Law, Commercial—2.
Literature, English—3.
Physics, Light and Sound 3.
Zoology—3.
Laboratory Practice 3.
Physical Laboratory—2.

SECOND TERM.

Botany, Microscopic Examination of Food 1.
Laboratory Practice—1.
Chemistry, Organic—3.
Laboratory Practice—1.
Economic Science—5.
Elocution 1.
Entomology 5.
French—5.
Horticulture 5.
Literature, English—5.
Physics, Electricity and Magnetism—5.
One Oration (required)—1.

SECOND YEAR.

FIRST TERM.

Dairying –3.
Economic Science--5.
Elocution—1.
Geology and Mineralogy--5.
French—4.
History, Development of the United States—3.
Psychology—5.
Thesis (required)—1.
One Oration (required)—1.

SECOND TERM.

Astronomy—5.
Domestic Economy—1.
Laboratory –1.
Geology—3.
Elocution—4.
History of Civilization—5.
Horticulture –3.
Science of Morals—3.
Pathology, Vegetable—2.
Physiology—4.
Thesis (required)—1.
Evolution of Plants—1.
Evolution of Animals—1.

Remarks on the Courses of Study.

THE COURSES IN AGRICULTURE.

The agricultural course is designed to teach the sciences that underlie practical agriculture, and sufficient English literature, mathematics, history and other supplementary studies to sustain both scientific and practical agriculture and develops the agricultural student to the intellectual level of the educated in any profession. Special attention is given to the improved methods in all of the various operations of farming, of farm building, using tools and machinery, and management of all kinds of stock and crops. The instruction in this department embraces *principles and practices* of agriculture. No agricultural studies can be omitted.

The farm consists of rolling prairies, bottom and woodland, and is stocked with five breeds of horses, six breeds of cattle, seven breeds of sheep, and the finest specimens of swine common in the northwest. These animals are used in class illustrations and for the various experiments in breeding and feeding for milk, meats, wool, growth and sustentation, conducted by the Experiment Station as a department of the College. All the crops of the farm are grown for some educational purpose, and all reported upon in the Station Bulletins; all the animals are fed by rule and system, and the result of their management reported upon, and used in class work. Labor is not compulsory, but students in the agricultural courses are given work that is educational and parallel with their studies. Some students pay for their board by work in the mornings and evenings. Under the direction of the professors in charge, students are required to conduct experiments in all the departments of the course.

An elaborate butter and cheese dairy is fitted with all modern appliances. The dairy will be in operation all the year, and instruction in all of the operation and business features will be given by experts in dairying.

The experiment station will give attention to unsettled questions with regard to milk for all purposes, to the end that the dairymen of

the state may have all possible help in solving problems of their line of business.

A bacteriological laboratory, in charge of Professors Stalker and Pammel, will give students facilities for studying this science with regard to animal and plant life. Investigations in butter and cheese making demand this assistance

Graduates in the four year course are entitled to the degree of Bachelor of Agriculture, and must meet college requirements in standing, in all studies pursued, and present a final thesis upon some topic in agriculture.

DAIRYING.

The facilities for teaching dairying in a thoroughly practical and scientific manner are unexcelled by any college in the country. The dairy building is practically completed and equipped. It is something more than a "dairy building," as the term is generally understood. It is a practical working creamery and cheese factory, in operation every week-day in the year During the summer season from fourteen to twenty thousand pounds of milk are taken in daily and manufactured into butter and cheese; during the winter somewhat less. This milk comes from the farmers living in the vicinity of the college, and they are paid for it according to the amount of fat it contains, as determined by the Babcock test which the students are taught to use. The student becomes familiar with everything connected with the management of a commercial creamery, and meets every problem that is likely to confront him in his after work Five different kinds of separators are in use in the dairy building and the most approved machinery is used throughout.

The work done in dairying by the students of the four year course in Agriculture is outlined in the course of study. They not only become familiar with the work in the creamery and cheese factory and private dairy, but study the subject in its broadest sense and the underlying principles During the latter part of the Senior year those students who have shown themselves capable are permitted to spend a portion of their time in the laboratory in original experimental work, and meritorious work of this kind is reported in the bulletins of the Experiment Station.

The short courses in dairying were established for the benefit of those who expect to take it up as a business, either on the farm or in the creamery or factory, and for this reason a very large portion of the time is devoted to practical work in the dairy building Students in

these courses are taught everything connected with the practical work, from weighing the milk brought in by the different patrons and testing the same, to running the engine, scrubbing the floors and shipping the butter. The aim is to teach not only *how* to do all the work incident to a business of this kind, but also *why*—the reason—the work should be done in the manner taught. The studies other than dairying proper which appear in the courses outlined are such as are necessary to a correct understanding of the principles involved, and all students entering these courses are required to attend them regularly.

JAMES WILSON, Professor.

HORTICULTURE AND FORESTRY.

These studies form a part of the course in Agriculture. Singly and alone the time allotted to this technical line of study and practice could accomplish little more than to make the student familiar with some of the leading modes and methods of empitical gardening, considered mainly as a mere art. Supported, however, by the full course in natural sciences, the routine of horticultural operations rises above the level of unreasoning custom to the rank of applied science. The cultivated plant becomes a thing of life, varied in vitality, habit of growth, and fruitfulness by conditions of soil and air more or less under control.

The studies begin with the second term of the Freshman year. No text books are used in this or the Sophomore year, as in the consideration of the subjects of small fruit growing, orcharding, lawn-planting, flower border and forestry, we have no text books as yet adapted to our prairie soil and climate. Instruction is imparted by lectures, making every possible use of the many instructive object lessons of the grounds, the nurseries, the orchards and the horticultural museum.

The supporting studies in Botany, Chemistry, Entomology, Agriculture, etc., fit the Junior class for the intelligent consideration of theoretical horticulture, enabling the student to comprehend important principles pertaining to vital force, germenation, root and stem growth, leaf formation and functions, climatic adaptation, etc., intimately associated in our State with failure or varied degree of success in all horticultural operations.

During the second term of the Senior year a general view is taken of the influence of horticulture and forestry on the civilization of the earth and the health and comfort of its inhabitants. In connection the valuable work of Hon. G. P. Marsh is used, "The Earth is Modified by Human Action."

MEANS OF PRACTICAL ILLUSTRATION.

1. The vegetable gardens.
2. The flower borders.
3. The ornamental grounds.
4. The experimental nurseries.
5. The experimental orchards.
6. The small-fruit plantations.
7. The forestry plantations.
8. The propagating rooms.
9. The propagating pits under glass.
10. The collection of native and cultivated woods.
11. The collection of injurious and beneficial insects.
12. The set of abnormal and diseased growths.
13. A set of fac-simile fruit casts.
14. The historical museum; now accumulating.

LABOR.

To illustrate each branch, and to enable the student to become familiar with methods and processes, and to acquire some skill, he is expected to engage in such labor as will best promote a knowledge of the particular study in hand for about five hours each week under the instruction of Professor or foreman. Such labor combined with instruction, is in the course of study, denominated, "Field Lectures with Practice," or Farm and Garden Instruction.

J. L. BUDD, Professor.

AGRICULTURAL CHEMISTRY.

The Department of Agricultural Chemistry and the Chemical section of the Experiment Station occupy a large part of the first floor in Agricultural Hall. Here are situated the laboratories of both divisions, connected with which are the lecture room and office. Each of the laboratories is equipped for carrying on the work of its special branch of Chemistry. The recent addition of a new laboratory enables the department to offer better opportunities for laboratory work in Agricultural Chemistry than in previous years.

The course of instruction is by means of text books and lectures in connection with a course of practical work in the laboratory on which recitations are required. The instruction in Agricultural Chemistry includes the chemistry of soils and its relations to the

plant; air, water, etc.; this is followed by the chemistry of the plant. The chemistry of animal nutrition and the chemistry of the dairy are also studied.

The laboratory work includes the study of the compounds and elements which are important in connection with the science from observations on simple substances to the quantitative estimation of the substances which are useful in agriculture. The analysis of various feeds and fodders, milk, butter, cheese, etc., are carried out by the student which gives him a practical insight into the processes connected with this work. The laboratory work is made individual as much as possible.

Those who desire to make a special study of Agricultural Chemistry are encouraged to do so. The libraries of the Station and College are readily accessible to those who may desire to make use of them. The experimental work which is constantly carried on in the chemical section offers many opportunities for object lessons to those who desire to take advantage of them.

J. B WEEMS, Professor.

THE COURSE IN VETERINARY SCIENCE.

(A Three Years' Course).

It is the purpose of this course to train students for the practice of veterinary medicine, to fit them for the work of original investigation and to fill positions where scientific and technical knowledge is required. With these ends in view, a thorough course of instruction has been adopted, embracing the most approved methods of theoretical and practical teaching. The corps of instructors includes ten professors, and the facilities offered in the several subdivisions of the work are the very best of their kind. A large and well appointed hospital is kept constantly filled with patients; besides a free clinic is held each day at the hospital, which students are required to attend. A fine anatomical and pathological museum affords the students unusually good facilities in the pursuit of these branches.

ANATOMY is taught during four terms, as seen by the schedule of studies for the Veterinary Course. Abundant material is furnished for work in the dissecting room, and a demonstrator is in attendance during the working hours. The lectures on anatomy are illustrated by the best style of models and carefully prepared natural specimens.

VETERINARY MEDICINE AND SURGERY.—These subjects embrace theoretical and practical instruction in the treatment of diseases

to which all domestic animals are subject, as well as the theory and practice of surgery. Members of the Senior class are made familiar with the uses of the instruments and the administration of medicines.

CLINICS. One hour each day is devoted to clinics. All students are not only required to attend these exercises, but must assist in the work. The higher class men are allowed to perform such operations as they have frequently seen performed before the class.

ZOOLOGY. In the second term of the Freshman year and the first term of the Junior year there are two recitations per week in zoology, dealing mainly with vertebrates. During this time the student spends one afternoon each week in the laboratory in the dissection of typical forms.

BOTANY. In the second term of the Freshman year the student acquaints himself with general botany, and gives some attention to the identification of plants. In the spring term of his Junior year the student takes up pharmaceutical botany and makes a collection of twenty medicinal species, named and mounted. In the first term of the Senior year Bacteriology and methods of cultivating bacteria and means of preventing contagious diseases are taken up.

Chemistry. The elementary chemistry is the same as that given in the first term of the Sophomore year of the Course in Sciences as related to the industries. In the Senior year the work includes the detection of poison; analysis of urine from healthy and diseased animals; examinations of food and of water; qualitative and quantitative analysis of the secretions in and excretions from the body, together with such work as the clinical department may require. Students also compound or make medicines required by the department. During the second term original work is required

This department is really a College of Veterinary Medicine and Surgery, and has the fullest equipments for thorough instruction and practice. The course or study leads to the degree of Doctor of Veterinary Medicine, (D. V. M.)

A THREE YEARS' COURSE. It will be noticed that beginning with 1888 the Veterinary Course was made a three years' course. This was chiefly to make the course technically more complete, but partly also to give time for special drill in general science, and in the use of the English language for those who from early disadvantages may be deficient therein. See special catalogue.

M. STALKER, Professor.

HISTOLOGY, PHYSIOLOGY AND PATHOLOGY.

HISTOLOGY.--This embraces systematic histology, which is taught by lectures throughout the first term of the Freshman year, and practical histology, including the microscopic study of the tissues of the animal body. The various methods of preparing tissues for microscopic examination are taught with the object of familiarizing the eye of the student with the minute anatomy of the tissues of the animal body.

PHYSIOLOGY is commenced in the second term of the Freshman year, and includes four lectures and recitations a week for the entire term. This course is introduced by a series of lectures in embryology. A more advanced course in Physiology is carried through the first term of the Junior year, including three lectures and recitations a week.

PATHOLOGY.—Pathological specimens of all kinds are brought before the class for the purpose of familiarizing the student with the appearance of diseased tissues. The relations of pathological histology to the principles of medicines and surgery are carefully studied, and the advances made in the application of the microscope to exact pathology fully considered. The study of General and Pathological Histology extends through the second term of the Junior year and includes three lectures a week.

During the first term of the Senior year a course of two lectures a week is given on Comparative Pathology, which includes a study of the effects of micro-organisms in producing disease. A course of laboratory work is required of each student, including twelve weeks (one afternoon each week). The student is at first given a few simple structures, the nature of which is known to him. After working these specimens out and making drawings of their microscopical structure he is required to work out as many unknown specimens, both simple and complex, as possible, making drawings and determining their nature.

THERAPEUTICS.—The physiological action and therapeutical value of medicine used in veterinary practice are carefully considered throughout the Senior year.

W. E. HARRIMAN,
Professor.

THE DEPARTMENT OF MECHANICAL ENGINEERING.

The headquarters of the department are in Engineering Hall, of which the basement and first and second floors are given up to its use. The first floor is occupied by the office of the assistant professor of

mechanical engineering and the machine shops. The latter are in two rooms, having a floor space of about 3 000 square feet, one of the larger rooms having a portion screened off for a tool room.

The machine shops are equipped with a twenty four by twenty-four inch planer, a milling machine, a universal grinding machine, a shaper, two drill presses, two emery grinders, a polishing wheel, a power hack saw, a cutting off machine, eight engine lathes of capacities from ten to twenty inches swing and three to eight feet between centres. and three speed and drilling lathes, together with the usual assortment of small tools in the tool room, and a sgt of pipe cutting and threading tools for pipe up to four inches in diameter.

In the machine shop is located a fan-blower for the blacksmith shop, which is temporarily provided for in a shed outside the building. The equipment of the blacksmith shop consists of eight Buffalo forges, anvils, tongs, fullers, swages, etc. Forging and welding of iron and steel and the tempering of small tools are set forth here.

The second floor is occupied by the office of the professor of mechanical engineering, computing room, blue-print and dark room, recitation room and a large drawing room. The recitation room will seat uthirty stdents, and the drawing room has tables for fifty; two hundred drawing boards and a considerable number of drawings, photographs, and blue prints complete the equipment of the drawing room. Both recitation and drawing rooms have ample blackboard space, which forms a valuable adjunct to the facilities for instruction.

The computing room, in addition to reference books, contains models and the more valuable instruments of the mechanical laboratory. Besides the above space in Engineering Hall, the department of mechanical engineering occupies the power house and the carpenter shop. The latter is a two-story frame building. The first story contains a universal buzz-saw, a mortising machine, planer, buzz-planer, sticker, jig-saw, and grindstone, while the second story is fitted up with fourteen turning lathes of different sizes, benches for twenty students and complete sets of small tools for twelve students, together with a number of special tools. A second room on this floor serves as a tool and stock room. The work of the student in this building consists of carpentry, turning and pattern work.

The power house contains a fifty horse-power Babcock & Wilcox boiler and a twenty-five horse-power Harlis-Corliss engine. Power is carried to the machineand carpenter shops by belting and shafting.

This building also accommodates a large amount of the mechanical laboratory of the department. The equipment of the latter, in

addition to the engine and boiler just mentioned, consists of a twelve horse-power Otto gasoline engine, the complete electric lighting plant of the College, which is installed in the power house and which has a capacity at present of 750 lights, there being two Edison machines on the three wire system and one Westinghouse alternator, a Wheeler condenser, three Worthington water meters, a Holly duplex pump, injectors, weir and weighing tanks gas meters, a Crosby steam guage tester, fan blowers for experimental work, a Westinghouse air-pump, a 50,000-pound Olsen testing machine, a complete De La Vergne refrigerating machine, gas analysis apparatus, two Thompson, two Crosby and one Richards indicator, dynamometers, a Prony brake, platform scales and some other apparatus essential and accessary to experimental engineering.

The system of instruction in the shops is a combination of the exercise and the "job-work" methods, the former being abandoned as the student becomes proficient.

The drawing room work begins with free-hand drawing and object drawing, and is followed successively by machine sketching, mechanical and kinematic drawing and designing The latter division occupies the last year and a half of the course.

Experimental work begins in the middle of the Junior year and extends to the end of the course The instruction in this subject is thorough, its scope being indicated by the following list of experiments: Tensile, transverse and compression tests of materials, properties of lubricants, measurements of power by absorpt on and transmission dynamometers, steam guage and indicator spring calibration, cement testing, flue-gas analysis, indicator practice, variation of engine speed, fan-blower tests, calorimetry, including barrel, throttling and separating calorimeters, weir and water meter calibration, efficiency test of steam engines, boilers, injectors, and steam heating, electric lighting, refrigerating, power and pumping plants, and Hirn's analysis of the steam engine.

All students taking shop work or mecnanical laboratory work are required to make a deposit of five dollars ($5.00) to defray the expenses of material, power and breakage.

In the class room the work is carried on by recitations and lectures, a text book and recitations being used wherever practicable; it is necessary however to present much material not found in text books, and in such cases recourse is had to the lecture system.

G. W. BISSELL, Professor.

THE COURSE IN CIVIL ENGINEERING.

The course in Civil Engineering is intended to prepare students for professional work in any of the leading lines of Civil Engineering, such as the design and construction of roads, bridges, railways, water works, sewerage and drainage works, and the conducting of surveys of every description.

The course has also many advantages for the general student who desires the mental discipline which comes from a thorough study of mathematics, and the direct application of its principles and methods to the investigation of the physical laws and forces of nature

It is believed that the best preparation an engineer can have is a thorough knowledge of the underlying principles of his profession, and that he should never attempt the application of these principles by the use of either empirical or rational formulas or rules, however well learned without first having a thorough knowledge of the laws and theory on which these formulas are based, and the means by which they are deduced. Such knowledge does not take the place of practical experience, but without it the "practical" engineer can only repeat what he has seen others do, and is in constant danger of violating the first principles of science and good engineering by making wrong application of some rule of thumb, as costly blunders have often shown

The course is arranged with the primary object of giving this knowledge, and later its application to practical work, in accordance with the best engineering practice. The ends kept in view are to give the student thorough training in the following lines.

First—Mathematics and sciences

Second—Technical drawing.

Third—The principles and practice of field work, and the use of engineering instruments

Fourth The principles of good engineering practice.

Besides the purely mathematical and engineering studies, the general education of the student is looked after by including in the course such studies as Rhetoric, English Language, Elocution, Economic Science, Psychology and French.

MATHEMATICS AND THE SCIENCES.—The work in *pure mathematics* extends throughout the Freshman, Sophomore and Junior years, and includes Algebra, Geometry, Trignometry, Analytical Geometry, and Calculus. In the Junior year the student has a thorough course in the application of mathematics to the Mechanics of Engineering, in which he studies the laws of force, work, energy and the resistance of materials, and learns how to compute the stresses in en-

gineering structures. In the Senior year he applies the principles of Mathematics to Hydraulics and to Spherical Astronomy.

The work in *Physics* extends throughout the Sophomore year, and the second term of the Junior year, and includes Mechanics, Heat and Electricity and Magnetism.

Chemistry is studied in the second term of the Sophomore and first term of the Junior years.

Geology and *Botany* are also included in the course as shown in the outline above.

For more detailed information as to the instruction in the sciences, and in pure mathematics, the reader is referred to the respective headings under which those objects are discussed.

DRAWING.—The work in drawing commences in the first term of the Freshman year with free hand drawing. In the second term the student has Mechanical Drawing and Lettering and in the second term of the Sophmore year he is instructed in the use of water colors. In the first term of the Sophomore and Junior year he studies the application of mathematics to technical drawing, under the heads of Descriptive Geometry and Shades, Shadows and Perspective. Instruction is given in platting, pen topography, the making of maps and profiles, and of engineering drawings, tracings and blue prints, in connection with the subjects of Land Topographical and Railway Surveying, and of Stereotomy, Bridge Designing and other engineering studies.

PROFESSIONAL STUDIES.—In the Sophomore year the student takes up Surveying. The legal principles of land surveying, and the principles and methods of land, mining and topographical surveying are taken up in recitations, while instruction in the use of instruments and in field work is given by actual practice in the field. For such work the department is well equipped, and the location of the College offers peculiar facilities for it. The student also has practice in making plats and topographical maps of actual survey.

In the Junior year Railroad Surveying is taken up. The instruction is by recitations, lectures and field practice. The methods and principles taught are those of actual work. In the field practice the students solve in the field a problem of location, making the preliminary survey, the topographical map, and the final location of a short line of railroad. They also cross section the line, calculate the grading, and make plans and estimates for the bridging.

In the Senior year the studies are nearly all professional. A course in Bridge Designing extends throughout the year, and includes

making an actual design of a truss bridge. A stone arch bridge is also designed. Sanitary Engineering and Hydraulic Engineering, including the principles and methods of the design and construction of system and sewerage and water supply, are taught by lectures. The principles governing foundations and the proper design and construction of masonry structures are also studied.

The preparation of a graduating thesis is a valuable part of the work in the Senior year. The student is counseled to choose a subject the study of which will most benefit him in his after work. Opportunities are offered him for original study and investigation

LABORATORY WORK.—This includes, besides Physical Laboratory Work, the testing of the strength of materials of construction and allied work in the Engineering Laboratory. The department has a complete cement testing outfit, and use is also made of the instruments and facilities of the Mechanical Engineering Department's Laboratory. It is attempted to give the student familiarity with the methods of testing which are in actual commercial use.

EQUIPMENT.—The department is located in the third story of the Engineering Hall. Its rooms include a class room with places for about sixty students, a draughting room with tables and drawing boards for about forty, an instrument and designing room,and the office of the department. The department has a goodly supply of transits, levels and their accompaniments, to which valuable additions have been made. Among its other instruments are a fine aneroid barometer, a polar planimeter, and a calculating machine. The equipment is increased each year as the needs of the department require.

A. MARSTON, Professor

THE COURSE IN ELECTRICAL ENGINEERING

The Electrical Engineering course is essentially a course in Mechanical Engineering, the degree granted being the same. It is stated in the diploma of the Electrical Engineering graduate that he has taken special work in theoretical and applied electricity.

The first two years of the Mechanical Engineering and Electrical Engineering courses are identical, and in the first term of the Junior year they differ in that general physical laboratory work is substituted for the shop work of the Mechanical Engineering course. Throughout the remaining three terms of the Electrical Engineering course the work is kept as closely in line with the corresponding work of the Mechanical Engineering course as is possible considering the special work in electricity. Students taking the Electrical Engineering course are urged to pay especial attention to those topics which are

important in the Mehanical Engineering course, *e. g.*, pure and applied mathematics, mechanical drawing, and shop work.

The physical laboratory is equipped so that the laboratory courses offered can be carried on satisfactorily.

For description of the various courses in elementary physics, theoretical and applied electricity and laboratory practice, see Physics.

For description of shop work, mechanical drawing and special engineering topics, see Mechanical Engineering

W S. FRANKLIN, Professor.

MATHEMATICS.

ALGEBRA. – In Algebra, five exercises per week during the first term, Freshman year are required of all students in the four-year courses of study. The class is divided into three divisions. The first two are composed of students whose entrance examinations show thoroughness in Arithmetic and a working knowledge of the principles of Algebra through equations of the first degree. The second includes all students who obtain a high standing in Arithmetic and pass the required examination in Algebra, but show in the latter study a want of thoroughness. In the presentation of this subject particular attention is given to the explanation of cardinal principles, and the class drill is conducted with reference to fixing these principles in the mind of the student.

Advanced Algebra is pursued during the second term of the Freshman year by students in the engineering courses In order to secure that ready familiarity with the algebraic process necessary to success in higher mathematical work, the student is required to solve a large number of examples and problems of the character he will meet with in the advanced studies of his course. In addition thereto, the term's work includes a study of series, undetermined coefficients, the theory and use of logarithms, and the theory of equations.

GEOMETRY. – Students who complete the Algebra of the first term, Freshman year, securing a standing of three (four being perfect), are permitted to enter the class in Geometry. The class is divided into divisions corresponding to those in Algebra. The student is early taught the full meaning of a geometrical demonstration. He is warned against learning any proposition by rote, and in order that he may not fall into this error, he is at the end of the first book, assigned original theorems, which he is required to demonstrate. He is expected not only to understand thoroughly each proposition, but to be able to so arrange and present the points of proofs as to form a complete and perfect demonstration.

TRIGONOMETRY. -Instruction is given in plain Trigonometry during the first nine weeks of the Sophomore year, to all students in the four-year courses. The class is thoroughly drilled in the nature and use of trigonometric functions and the solution of right and oblique triangles. During the remaining eight weeks of the term, students in the mechanical, civil and electrical engineering courses pursue the study of spherical Trigonometry. The text-book in both plane and spherical Trigonometry is Wheeler's.

ANALYTIC GEOMETRY.—This study is pursued by the Sophomore class during its second term. The course of instruction embraces determinate and indeterminate Geometry, including a full examination of the conic sections. The underlying principles are brought prominently forward and discussed. The student is required carefully to analyze each article and solve the problem connected therewith. To secure thoroughness, frequent reviews are given Newcomb's is the text-book used.

CALCULUS. Instruction in Calculus is given during the spring term of the Junior year. To enter this class it is necessary that the student should have passed the lower mathematical studies of the course. In no case can this study be pursued successfully without previous drill in analytic geometry. The abstruse principles of this method of mathematical investigation are explained upon the theory of *limits*. The theory of *rates* is also employed to a considerable extent. Instruction is given by daily recitations and lectures, with a review of the week's work each Friday. Twelve weeks are devoted to differential, and the remainder of the term to integral Calculus. Text-book, Osborne. E. W. STANTON, Professor.

DEPARTMENT OF PHYSICS.

EQUIPMENT. -The Department of Physics occupies the second floor (five rooms), the third floor (two rooms) and one room in the basement of the Chemical and Physical Hall, and seven rooms in the basement of the old cottage. The dynamo laboratory is located in the power house of the Mechanical department. The Physical lecture room has a seating capacity of about seventy-five and is used afternoons for laboratory purposes. One of the third floor rooms is fitted up as a repair shop, with two foot lathes, a complete set of small tools and a stock of shop supplies. The other third floor room is used as a battery room and as a photographic laboratory

The apparatus belonging to the department includes a long list of standard measuring instruments to the value of about ten thousand dollars, and a large amount of apparatus of home construction. The

dynamo laboratory is equipped with ten experimental dynamos from ½ to 6-horse power. A system of wiring and switch boards connects the various parts of the laboratory with the dynamo room.

The following courses are now offered by the department. Courses six to seventeen are designed especially for engineers; seven, ten and seventeen are, however, open to other students as electives.

1. Mechanics and Heat, five hours per week. Spring term. Algebra (complete) and Geometry required. Students who take this course are urged to supplement it by electing Physics, ten, during the spring term of their Junior year.

2. Light and Sound, three hours per week. Spring term. Physics, one or six, and Trigonometry required.

3. General Astronomy, five hours per week. Fall term. Algebra (complete), Geometry and Trigonometry required.

4. Spherical and Practical Astronomy, three hours per week. Fall term. Calculus required.

5. Theory and Practice of Photography, one lecture and one afternoon per week. This topic does not appear in any course of study. It is only open to upper class men and to them only upon recommendation from head of department in which they take their major.

6. Elementary Mechanics and Heat. Spring term, five hours per week and Fall term three hours per week. Algebra (complete) Geometry and simultaneous work in Trigonometry and Analytical Geometry required.

7. Electricity and Magnetism, five hours per week. Fall term. Calculus and Physics, *one* or *six* required.

8. Dynamo Electric Machinery, four hours per week. Spring term. Physics, seven required.

9. Applied Electricity, four hours per week Fall term. Physics, eight required.

10. General Physical Laboratory, two afternoons per week. Spring or Fall term. Physics, one or six required.

11. Physical Laboratory.--Elementary Electrical Measurements, two afternoons per week. Spring or Fall term.

12. Physical Laboratory.--Electrical Testing, two afternoons per week. Spring or Fall term.

13. Physical Laboratory.—Dynamo and Motor and Commercial Plant, testing, two afternoons per week. Fall term.

14. Electric Light Wiring, one recitation per week. Fall term. This topic does not appear in any course of study. It is not open to Freshmen.

15. Electrical Designing. -Batteries, Commercial Ammeters, Voltmeters, Wattmeters, etc., one afternoon per week. Spring term.

16. Electrical Designing. Dynamos, Motors, etc, two afternoons per week. Fall term.

17. Theses in Physics and Electrical Engineering.

In the above courses great stress is placed upon mathematical theory and those students who have access to any course as an elective are urged to look to their mathematical preparation.

A fee of $5.00 per term is charged for courses ten, eleven, twelve and thirteen. In case the student takes but one afternoon per week the fee is $3.00 per term

W. S. FRANKLIN, Professor.

CHEMISTRY.

For the length of time devoted to each branch of Chemistry, and the time in the various courses when taken, the reader is referred to the outlines of these courses for information

The work is conveniently grouped under the following heads. (a) general chemistry; (b) analytical chemistry, qualitative and quantitative, (c) organic chemistry; (d) special forms and methods of analysis; (e) preparation of compounds and mixtures.

The work consists of recitations from text-books, lectures and laboratory practice. The laboratory work is the basis of the study of chemistry as taught here.

(a) GENERAL CHEMISTRY. The work included under this head is largely descriptive and theoretical, but is based on experiments performed by the students. The student, by proper laboratory practice, gains a knowledge of what a scientific experiment is In order better to train his powers of observation the student is required to describe the apparatus used and the phenomena produced, and to trace the relation of the results obtained to the principles and laws which underlie them. This work is preliminary to all the elections in chemistry that are offered in the Junior and Senior years.

(b) ANALYTICAL CHEMISTRY.—Elementary qualitative analysis is included in the work of the second term of the Sophomore year. The elective and analytical chemistry consists of advanced qualitative analysis. In the elementary qualitative analysis the student must give evidence that he is qualified to make complete analysis of fairly complex mixtures. He makes from twenty to thirty analyses of sim-

ple substances and about twenty in addition of the more complex mixtures. The recitations are devoted to the study of the methods of analysis and the principles upon which they are based.

The advanced qualitative analysis deals more particularly with complex technical substances, such as ores of various kinds, limestones, iron, steel, etc. The recitations are upon the laboratory work and theoretical chemistry.

Quantitative analysis consists of gravimetric and volumetric determinations and separations, using first, pure chemicals, and afterwards impure substances. In the recitations, methods of analysis are described and discussed and the study of theoretical chemistry carried forward.

(c) ORGANIC CHEMISTRY This subject, as taught in the Junior year of the Science Course, is intended to give the student a fairly complete outline of the theory of the structure and formation of organic compounds, but especial attention is paid to those compounds that are of commercial importance. The student prepares many of the more important manufactured organic substances. He makes a special study of such substances as alcohol, vinegars, sugars, petroleum and its products, glycerine, soaps, etc This elective is open to students who have completed either (a) or (b).

One lecture per week is given to the Juniors in the engineering courses on the metallurgy of the important metals Particular attention is paid to the study of iron and steel, *i. e.*, to their chemical composition and to the effects that impurities have on their physical and chemical properties

Students electing the "chemical group" of studies take (b) and (c) in the Junior year. In the Senior year they may select work under (d) and (e) The work will consist of laboratory practice and such recitations as will best forward and explain this laboratory work. The department furnishes facilities for work in the following branches: Organic analysis, ultimate and proximate; advanced qualitative analysis; analysis of agricultural substances and products; preparations of compounds and mixtures, especially pharmaceutical compounds. During the Senior year the student does the work upon which his graduating thesis is based. Students preparing for medicine will be permitted to select work especially bearing on this subject

The work in the Veterinary Course is done during the Junior year and a portion of the Senior year. It is introduced by an elementary study of general chemistry, followed by a short course in qualitative analysis. Special attention is given to those compounds that are of

importance in Veterinary Medicine. Attention is also given to inorganic poisons and the general effects of these poisons on the animal body.

During the first half of the third year of the course the student studies elementary Physiological Chemistry and a sufficient amount of the general principles of Quantitative Analysis to enable him to make complete analysis of urine.

Students in the Mining Engineering Course take (a) and (b); but from this point in the course the work diverges from the course in the Sciences and follows subjects closely connected with mining operations

Blowpipe Analysis is taken up in the second half of the Junior year. The student becomes familiar with the minerals, mixtures and alloys by means of the characteristic chemical changes produced by blowpipe flames in connection with the commonly used reagents. This work is intended to support and supplement the subjects of descriptive Mineralogy and Crystallography, which are studied in the department of Geology

Metallurgy is studied throughout the senior year, and will consist of recitations, lectures and laboratory work. Under this subject is embraced a study of the apparatus used in the various metallurgical processes, and the materials from which it is constructed, fuels and the processes used in the preparation of the useful metals.

The facilities for instruction in this department are ample and increasing from year to year. Room is provided for one hundred and ten students working at one time. Each student has gas. water and reagents at his table.

The expenses are only sufficient to cover the actual cost of the material used or destroyed in the prosecution of the work.

A. A. BENNETT, Professor.

BOTANY.

COURSE I—All students, with the exception of the Engineers, are required to take Elementary Botany. In the agricultural course, in the course in sciences as related to the industries, the course for ladies. This work begins in the second term of the Freshman year. Gray's Elements of Botany is used as a text-book. The work is supplemented by a course of lectures on Physiological subjects. 1. Pollination of flowers. The subject is divided up as follows: Structure of flowers and various modifications to secure cross pollinization in plants their superiority over self-fertilized. The subject is illustrated by stereopticon views. 2 Dissemination of fruits and seeds.

by wind, water, animals, etc., with special reference to the introduction and migration of noxious weeds and other plants. 3. Insectivorous plants. How certain plants catch living animals and appropriate to themselves organic matter from them.

It is only possible to teach these subjects comprehensively by a large number of illustrated charts and specimens, with which the department is provided. Living material is also obtained. Each daily recitation in the text-book is supplemented with talks and specimens, students drawing different kinds of leaves, buds, flowers, etc.

References—Bastin: Elements of Botany. Mueller: Fertilization of Flowers; Lubbock: Fruits, Flowers and Leaves; British Wild Flowers, etc ; Darwin: Fertilization of Flowers; Gray: Structural Botany, etc.

COURSE II—The course in Physiological Botany consists of laboratory and class room work. Since students are unfamiliar with the use of the microscope, they are taught the use of the same. They begin with very simple objects, such as an air bubble and cotton fibre. They then pass on to the study of the cell with its contents, such as starch, protoplasm, nucleus and crystals. The laboratory work supplements the class-room work; the different organs and parts of the plant are taken up, not merely as historical structures, but considered from a physiological standpoint. As an illustration, the cuticle, cuticularized and cellulose layers of the epidermal cells of an agave leaf are considered with reference to their significance in preventing transpiration. The absorbing, assimilating, ærating and conducting systems are considered in the same way. In addition to this work, the student prepares an herbarium of fifty species of native plants of Iowa. The only text-book used is Goodale's Physiological Botany. This is supplemented by talks on the subject of nitrification, symbiosis, and the part played by micro-organisms in the acquisition of nitrogen.

References—Bessey: Botany for High Schools and Colleges; Sachs: Physiology of Plants; Strasburger and Hillhouse: Practica Botany; Campbell: Structural and Systematic Botany; DeBary: Comparative Anatomy of the Phanerogams and Ferns; Mac Dougal: Plant Physiology.

COURSE III.—*Cryptogamic Botany*. The second term of the Sophomore year is devoted to the study of Cryptogams. Special attention is given to "rusts," "smuts," "moulds," and "mildews." The morphology and life history is taken up of the different groups of Cryptogams. Methods of exterminating these pests are dwelt upon.

Owing to the absence of a suitable text-book in English, the writer has prepared a syllabus which is used as a basis for the lectures.

Vegetable Pathology comes in the senior year, in which plant diseases of farm and garden crops are taken up. In this course lectures on the more injurious of the fungus diseases of cultivated plants are considered in a more extended way than it is possible to devote to the subject in the Sophomore year. The theory of immunity and prevention of diseases, rotation of crops and fungicides are considered.

References DeBary: Comparative Morphology and Biology of the Fungi, Mycetozoa and Bacteria; Goebel: Outlines of Classification and Special Morphology; Zopf: Die Pilze; Sorauer: Pflanzenkrankheiten. The Standard Experiment Station Literature. Division of Vegetable Pathology United States Department of Agriculture; Ludwig: Die Niederen Kryptogamen etc.

Bacteriology is an elective study for students in the course in sciences as related to industries, agricultural, and course for ladies but required of the senior veterinary and junior agricultural students. The laboratory work consists in studying the germs of various diseases and the methods of cultivating bacteria. In the lectures special attention is given to sanitation and means of preventing contagious diseases. The course consists of one laboratory and one recitation per week, using Abbott: Principles of Bacteriology.

Inasmuch as the veterinarian has to deal not only with the diseases that affect the human race but also many diseases that do not occur in man, a special text-book Mosselman & Lienau Dinwiddie Veterinary Microbiology, is used.

Senior agricultural students make a study of bacteria in the ripening of cream, and the part played by these organisms in the ripening of cheese, etc. These are studied practically in the creamery to see the effects. The importance of bacteria in the decomposition of organic matter is also considered.

An elective of two hours bacteriological work is allowed in the first term of the senior year in the course in sciences Students intending to enter a professional life will find this course of value in their future work.

References—DeBary: Bacteria; Senn: Surgical Bacteriology; Crookshank: Bacteriology; Salomonsen: Bacteriological Technology for Physicians; Conn: Fermentations of Milk; Sternberg: Manual of Bacteriology; Fraenkel: Bacteriology; Sims-Woodhead: Bacteria and their products; Russell: Dairy Bacteriology; Grotenfelt-Woll: Modern Dairy Practice

COURSE IV Pharmaceutical Botany has been specially arranged for students in the veterinary course. In the laboratory some of the principal medicinal plants are taken up, supplemented by a course of lectures.

References Fluckiger any Hanbury: Pharmacographia; Johnson: Medical Botany.

COURSE V. In Applied Botany two exercises a week are devoted to the study of food from a microscopical standpoint. The following will serve as an outline: Wheat, origin of, botanical place in the vegetable kingdom, structure of seed, histology of the stem, leaf, etc., chemical composition. Each one of the staple cultivated plants is taken up in the same way. Some of the more important drugs are also studied. In addition to the lecture and laboratory work the student is assigned some independent work which he looks up and reports on. Text DeCandolle: Origin of Cultivated Plants.

References - Darwin: Animals and Plants under Domestication; Harz Landwirthschaftliche Samenkunde; Moeller: Mikroskopie der Nahrungs und Genussmittel aus dem Pflanzenenreiche; Storer: Chemistry in its Relation to Agriculture; Simmonds: Tropical Agriculture Vilmorin—Andrieux: Vegetable Garden; Crozier. Popular Errors About Plants; Bailey: The Nursery Book.

COURSE VI.—Civil Engineers take up the study of microscopic structure of woods in the second term of the freshman year. This course consists of one laboratory lesson a week and one recitation In the Senior year a part of the time is devoted to a study of decay and preservation of timber. The remainder of the term is given to a study of the germs important to sanitation.

COURSE VII. -*Seeds and Grasses* It has long been recognized that grasses constitute our main supply of food for live stock. It is therefore one of the important farm products. This course is given only to senior agricultural students and is intended to give an intelligent idea of the relationship of grasses and those commonly cultivated and their importance from an agricultural standpoint. The course consists of sixteen lectures and sixteen laboratories.

References F. Lamson-Scribner: Grasses of Tennessee; Geo. Vasey: Agricultural Grasses of the United States; Flint: Grasses and Forage Plants; Beal: Grasses of North America; Stebler: Best Forage Plants; Lowe: British Grasses.

GENERAL EQUIPMENT.—The Department of Botany offers superior facilities in the way of instruction. The herbarium is very full in plants from Iowa and the Mississippi valley, besides having a

large number of plants from the eastern states, California and Europe. By purchase it has obtained the Parry Herbarium and library, with the exception of the various Herbaria in the Missouri Botanical Garden, the Agricultural College has the best collection of plants in the west. It owns thirty microscopes, each having a low and high power objective, in addition to these six oil-immersion lenses. The department is also furnished with the necessary appliances for doing bacteriological and physiological work. The department obtains material from the plants grown by the Departments of Agriculture and Horticulture, the grounds of the latter being very rich in ligneous plants from Europe, Asia and America.

Senior and post-graduate students are stimulated to do original work, and when theses are deemed of sufficient importance they are published; the author deposits twenty-five extras with the department, also one with the library. L. H. PAMMEL, Professor.

ZOOLOGY, ENTOMOLOGY AND GEOLOGY.

ECONOMIC ENTOMOLOGY. -A course of about thirty lectures or recitations upon insects, especially those of importance economically. The principal groups are defined and each student examines typical forms and prepares a collection of common species. Second half Freshman year.

ZOOLOGY, (*Invertebrate Morphology*). An introductory study of animal structures. Dissections or microscopical study of type forms, such as amoeba, hydra, earthworm, clam, crayfish, grasshopper, etc., form the basis for a discussion of the principal groups of invertebrates and the principles of classification. Second half Sophomore year. Reference works: McMurrich, Lang, Hatschek, Brooks, etc.

ZOOLOGY, (*Vertebrates*). Embraces a systematic study of vertebrata and includes work upon their comparative anatomy, histology and embryology. Six hours per week are spent in the laboratory in dissections, microscopical work, microtomy, etc. The term's work is intended not only to give a general knowledge of the different groups but to furnish instruction in methods of zoological research. Elective first half of Junior year. Reference works: Claus-Sedwick, Huxley, Weidersheim, Packard, etc.

ENTOMOLOGY.- A course of lectures and laboratory work dealing with the structure, life histories, habits and classification of insects Intended to prepare students for independent investigation in this line, especially in the field of economic entomology. Students have access to a library including the works of the best writers on entomology; to the rich collections of native insects and the opportunity

to observe the work carried on in this direction in the experiment station. Elective, second half Junior year to students who have had preceding work.

EVOLUTION OF ANIMALS.—A course of lectures dealing with the problems and factors of organic evolution as applied to animal life; theories of evolution, heredity, origin and distribution of life, etc. Elective in Fall term of Senior year.

Opportunities for advanced work in senior and post-graduate courses are offered to those who have had the necessary antecedent studies.

Students in the Veterinary course are given two exercises per week second term first year and three exercises per week first term second year in Zoology, and two exercises per week in second term second year on animal parasites.

Teachers who desire to spend a portion of their summer vacations in special work are allowed opportunities for work in the laboratory upon such lines as they may be prepared to pursue.

EQUIPMENT.—The laboratory is well supplied with microscopes, microtones and all necessary apparatus and materials for work, while a series of Leuckhart-Nitzsche charts and sets of skeletons and typical examples for different groups of animals are available in the class room.

GEOLOGY.—This embraces a study of the principles as covered in Le Conte's Elements, geological excursions with reports thereon, a review of the geology of Iowa, study of typical fossils, construction of geological maps, etc. Five exercises per week first half Senior year.

ECONOMIC GEOLOGY. A continuation of the previous term's work in geology with special attention given to deposits of economic importance to agriculture or mining. Required of students in mining enginering course and elective for students in other courses who have had antecedent chemistry, physics and geology.

MINERALOGY AND PETROGRAPHY.—The study of mineralogy is introduced by a course in crystallography, followed by a study of the optical properties of minerals, and embraces class and laboratory work, four exercises per week in each term of the Junior year. Required of mining engineers.

Petrography occupies two exercises per week in second term Senior year, lectures and laboratory work on typical rocks.

The museums in Zoology and Geology which occupy two floors of the north end of Morrill Hall contain a large amount of material

illustrative of the facts presented in the class room and also much material available for special investigations

HERBERT OSBORN, Professor.

BIOLOGICAL WORK.

By combining the different biological studies of the general course with certain studies of the veterinary school, it will be seen that a student can devote two years almost exclusively to biological work. Those who desire to spend only a limited time, and who are not candidates for degrees, may, if properly prepared, select entirely from studies in these branches. The selections possible are as follows: First term: Botany, Zoology and Entomology. Second term: Histology, Botany, Physiology and Zoology or Embryology. Third term: Botany, Histology, Physiology, Bacteriology and Anatomy, or Paleontology. Fourth term: Zoology, Pathology, Comparative and Human Anatomy and Botany.

GROUPS IN BOTANY, CHEMISTRY AND ZOOLOGY.

Any student classified in the *course in sciences* as related to the industries or the *ladies' course*, who desires to carry the study of Botany, Chemistry or Zoology further than is indicated in the outlines of these courses, can do so by selecting one of the following groups, provided the necessary antecedent studies have been taken. The subject of the graduating thesis must relate to the leading science of the group selected.

I. GROUP IN BOTANY.

Junior Year—First Term: Botany—2, Zoology—5. Second Term: Botany—5, Zoology (Entomology)—5.
Senior Year—First Term: Botany—5, Geology—5. Second Term: Botany—5, Thesis—2.

II. GROUP IN CHEMISTRY.

Junior Year—First Term: Quantitative Chemistry—5, Physics—3. Second Term: Organic Chemistry—4, Physics—4.
Senior Year—First Term: Chemistry—5, Geology—5. Second Term: Chemistry—5, Thesis—2.

III. GROUP IN ZOOLOGY.

Junior Year—First Term: Zoology—5, Chemistry or Physics--5, Botany--2. Second Term: Zoology—5, Chemistry—4, Physiology--4.

Senior Year--First Term: Zoology—5, Geology --5. Second Term: Zoology—5, Botany--2, Thesis--2.

These studies are required in each group. The student will select from those offered in the outlined courses others in numbers sufficient to aggregate not less than sixteen nor more than twenty exercises each week.

PHILOSOPHY.

PSYCHOLOGY - The study of Psychology gives an analysis of the intellectual powers, and discovers the laws of thought, thereby enabling the student to think with greater accuracy and clearness on any subject; and since success in every kind of activity depends on clearness of thought, Psychology is one of the most "practical" studies A text is used and supplemented by lectures and library work.

ETHICS --The last term of the Senior year is given to the study of the Science of Morals. Janet's Elements of Morals and Calderwood's Moral Philosophy are used as text-books, supplemented by library work and lectures. All callings and pursuits in life are based upon some element of moral obligation. It is the purpose of this instruction in Ethics to give a student a most practicable acquaintance with the duties of a faithful life and good citizenship.

W. M. BEARDSHEAR, Professor.

POLITICAL ECONOMY.—The study of this division of social science begins in the second term of the Junior year. It is taught by text-books, familiar lectures and class discussions. The student is made acquainted with the laws of production; the principles of money foreign trade, tariff, taxation, and all the influences that quicken or retard exchange; and the various theories of distribution and consumption. He thus becomes familiar with the scientific data that underlie and regulate industry, and that in great measure should determine the grave questions of public policy concerning which there is so wide a diversity of opinion. Text-book: Walker. This study is continued during the first term of the Senior year, the subject being viewed from the historical standpoint and treated in accordance with

the historical method now almost universally employed in advanced work in the social sciences. The development of economic thought is traced through the ancient, the mediaeval and the modern world. The successive economic schools are taken up; their doctrines are considered in connection with the existing industrial conditions; their gradual modification and displacement by other systems is noted; and thus, through a study of the growth of economic thought, the student is led to a clearer understanding and better judgment of the economic theories and practical industrial problems of the present time. The History of Political Economy, by Ingram, is used as a text-book; also Blanqui's History of Political Economy.

E. W. STANTON, Professor.

COMMERCIAL LAW.—It is the aim in this study to present the general principles of law relating to ordinary business transactions. Contracts, agency, partnership, sale of goods, commercial paper and real estate are studied. The changes in the common law made by statutes of the state are set forth by means of lectures. Particular attention is given to the forms of notes, bills, drafts, checks, etc , and by frequent reviews and examinations the student is made familiar with the requisites of the more common business papers

J. R. LINCOLN, Professor.

ENGLISH LANGUAGE.

English Grammar is reviewed in the Preparatory Department of the Fall term.

The study of Rhetoric is begun with the Freshman year. Some attention is given to word building and analysis, but the aim of the first term is to acquire a correct use of language The entire term is spent upon Diction and the elements of style as shown in the sentence.

Genung's Outline of Rhetoric is the text used This is supplemented by references to the many standard texts found in the library; also by reading and notes which bring out the "why" of the various constructions. Each member of the class writes papers which apply the principles learned. These papers, the subjects of which are usually taken from the writings of good authors or from current topics, are criticised and returned.

The fall term continues the study of style, giving special attention to those qualities which render discourse effective. During this term Genung's Practical Rhetoric is used as a text. Invention is carefully studied with due attention to the mental habits that promote

it. The principles of prose discourse are philosophically considered, description, narration, exposition and argument being studied, rhetorically analyzed and produced. The productions are criticised and may be subject to class criticism or discussion. Verbal discussion of all principles is encouraged not only with a view to bringing out the principles of the science, but also as drill in oral expression.

The work of the first term, Sophomore year, goes farther into the science of Language. Lectures are given setting forth the laws and forms of thought. The principles of argument studied are practiced in debate and argumentative essays. Genung's Rhetorical Analysis is used for analytical work.

Each member of the class writes papers for class criticism and a treatise upon some rhetorical subject.

All students entering the Freshman class will be asked to write a paper upon some of the following subjects:

Longfellow's Evangeline, Miles Standish, Hiawatha, Whittier's Snowbound, Tent on the Beach, Among the Hills, Barefoot Boy, Bryant's Flood of Years, To a Waterfowl, Planting the Apple Tree, Gray's Elegy in a Country Church Yard, Goldsmith's Vicar of Wakefield, Deserted Village, Tennyson's Enoch Arden, Webster's Bunker Hill Oration, Hawthorn's The House of the Seven Gables, The Great Stone Face; Macaulay's Essay on Lord Clive.

MARGARET DOOLITTLE, Professor.

FRENCH. French may be elected in the Ladies' Course in the Junior year and in the first term of the Senior year.

During the first term Chardenal's "First French Course" is used as text-book for the grammatical work. Mrs. Molesworth's "French Life in Letters" is translated this term and used for exercises in French composition. Particular attention is paid to oral reading and sight translation. In the second term the student takes up Chardenal's "Second French Course." Fenlon's Telemaque is translated this term and made the basis for dictation exercises In the third term the grammar is continued and standard work translated.

GERMAN. -German is an elective study in the Freshman and Sophomore years in the Ladies' Course, and in the Freshman year and the first term of the Sophomore year in the course in Sciences as related to the industries

During the first term the student uses as text-book Joyne's and Meissner's German Grammar. Continued drill is given in the principles of declension, conjugation and syntax In the second term the Grammar is completed and Hauff's Marchen translated and used for

oral and written composition work. In the third term Steiger's "Colloqual Method" is used as a text-book. Modern novels and plays are read and translated this term. The fourth term is devoted to the works of Goethe, Schiller or Lessing.

CELIA FORD, Professor.

ELOCUTION.

This course is arranged so as to meet the special needs of each student. Exercises in physical and voice work are given throughout the course. Physical culture not only increases the health and strength of the individual, but develops and prepares the body to express his thoughts and emotions more truthfully.

The object of the cultivation of the voice is to gain volume, flexibility, sympathy, and to enable the speaker to express his ideas consistently and with power. Recitals are given frequently in each class.

FIRST YEAR.

Articulation, analysis, animation, abandonment, imagination, personality in rendering, gesture, recitation.

SECOND YEAR.

Sight reading, advanced analysis and gesture, extemporaneous speaking, recitation, rendering of the great English orators.

THIRD YEAR.

Sight reading, extemporaneous speaking, advanced analysis and gesture, rendering of the Great American orators, rendering of Shakespeare.

MARIE L. CHAMBERS, Professor.

HISTORY.

The study of History begins in the Freshman year. A general sketch of the Roman Empire is given in lectures. The manner in which modern nations sprung from the break-up of that empire is explained, and then the History of England is carefully studied with special reference to those institutions and ideas which have received their final development in the United States.

In the Ladies' Course, History has two exercises each week through the whole of the Sophomore year. The course is the same as that described above.

In the first term of the Senior year there is a course in the *History of the Development of the United States.* The subject is studied topically—our geographical expansion, the growth of population, development of political principles, of education, churches, industries, etc., and the movements of population, wealth and industries, are investigated. and, so far as possible, their causes are determined.

During the second term of the Senior year, one hour each day is given to the *History of Civilization.* The progress of the race is summarily considered. The class make use of more than one textbook, guided by full references. Lectures are given upon the meaning and relation to human progress of government, religion, education, art, war and other institutions; also upon the characteristic features of the civilization of different nations. Little attention is given to the various theories concerning the origin of man or his faculties; study is mainly confined within the bounds of authentic history.

W. H. WYNN, Professor.

ENGLISH LITERATURE.

Three hours each week during the first term and five hours each week during the second term of the Junior year is devoted to the study of English literature. There are two courses—first, a course in American literature in the first term. Lectures are given in which the peculiar features of this literature are described and accounted for by those facts of race and environment and those questions of the times which directed the energies of Americans and stimulated our writers. Students are required to write a series of studies of the most important authors; and selected works are read and criticised as works of art, not as mere collections of philological material, the effort being always made to get at the secret of the writer's excellence and to follow the workings of his mind.

In the second course, which extends through the second term, the most important British authors are studied in chronological order, beginning with Chaucer and ending with Browning The principles applied and the methods of study in this course are the same as in the first course. W. H. WYNN, Professor.

MILITARY SCIENCE AND TACTICS.

It is not intended to complete the education of the thorough soldier, but to fit young men for filling, intelligently, positions in the

State troops as line officers and company instructors. The constant demand for men thus trained, emphasizes the value of a thoroughly organized and well sustained military course. The chief advantages derived are the requirements of a dignified carriage of the person, a gentlemanly deportment and a self-respecting discipline, with habits of neatness, order and punctuality. Opportunities are afforded each cadet for extending the studies in military science as desired, the College being provided with the necessary arms, accoutrements and outfits for drill and instruction in the infantry, artillery, and signal tactics, for which special classes will be formed. Lectures on military subjects are delivered throughout the course, and regular battalion drill and dress parade take place each Wednesday and Friday afternoons. All male students of the College, except such as may be excused for good reason by proper authority, are required to become members of the College battalion, and wear the prescribed uniform during military exercises. GEN. J. RUSH LINCOLN, Professor.

THE COURSE FOR WOMEN.

This course is much the same as the general course for men, except that more time is devoted to language and literature, and less to pure and applied science. A careful examination of the arrangement of studies, show that a lady may pursue a language study throughout the course and combine it with any two of the five named sciences. A lady student, for example, may take two years of Latin and two years of German, or two and a half years of either Latin or German and a year and a half of French. In addition to the other literary studies the lady student takes Botany one year and has the choice of any two of the following sciences, viz.: Mathematics, Physics, Chemistry, Zoology and Vegetable Physiology. Opportunities are given, to such as desire it, to take lessons in music and painting, and the very best instruction is provided in both these branches. Students have recitations and lectures upon the various topics in Domestic Economy. They are not required to perform a greater amount of labor than is necessary for the desired instruction. Other courses, especially the course in science, are also open to women.

DOMESTIC ECONOMY AND HOUSEHOLD HYGIENE.

It is the purpose of this course to interest and instruct young women attending the College in the manifold and complex duties relating to the home

The topics taken up in the lecture room are chosen with a view to securing to the student a knowledge of practical and systematic methods of rendering home a pleasant and healthful abode.

The laboratory practice is conducted upon the principle that no calling requires for its perfect mastery, more practice, combined with theory, than that of the housekeeper.

The second term, Freshman year, is given to a course of lectures on the composition of foods, and the demonstration of different culinary processes combined with laboratory practice. This work is selected with a view to giving variety and thus increasing its usefulness to the young women.

In the first term, Sophomore, special attention is given to the cooking and serving of meals. A course of lectures is given this term on house sanitarian and special hygiene.

To those of the Senior class who elect to give sufficient time to the work, a review of the work here outlined will be given together with practice in making out bills of fare and the selection and purchase of household supplies with a course of lectures on food adulterations and methods of detecting them.

The class kitchen is well supplied with the most improved and labor saving utensils used in general house work as this is a necessary part of a young womans educaiion, enabling her to perform intelligentlyand systematically those duties which it is a woman's highest privilage to assume in her capacity of housekeeper.

MRS. E. OWENS, Professor.

HIGHER DEGREES.

Such degrees are conferred upon candidates recommended by the Faculty, in conformity with the following rules:

1. The degree of Master of Science (M. Sc.) is open to Bachelors of Science who are graduates of the Course in Science and Agriculture, and of the Ladies' Course of this College.

2. The degree of Mechanical Engineer (M. E.) is open to Bachelors of Mechanical Engineering, and to Bachelors of Science before 1878, who are graduates of the Mechanical Engineering Course of this College.

3. The degree of Civil Engineer (C. E) is open to Bachelors of Civil Engineering, and to Bachelors of Science before 1878, who are graduates of the Civil Engineering Course of this College.

4. The degree of Master of Philosophy (M. Ph.) is open to graduates of any of the four year courses of study in this College.

The Faculty will recommend for the above degrees candidates otherwise qualified who, after taking their Bachelor's degree, shall pursue a two years' course of study embracing at least two subjects selected with the approval of the faculty from the list of post-graduate studies, and shall during that time reside at the College for at least one year and shall pass a thorough examination upon that course, showing in one of the subjects special attainments, and shall present a satisfactory thesis.

Each resident graduate must apply in writing for examination at least six weeks before the annual meeting of the Board of Trustees, stating explicitly the subject in which he desires to be examined, and at the time of examination (which may be four weeks before the meeting of the Board) he must present to the Faculty his final thesis.

The opportunity of resident study after graduation is a privilege granted only upon recommendation of the President and the Professors in charge of the studies to be pursued, and only to students whose conduct and scholarship in College seem to warrant the granting of the privilege.

Instruction and opportunities for advanced study are given in the following branches of post-graduate students, provided that undergraduate work shall not qualify a student for a post-graduate degree:

1. Psychology. 2. The Philosophy of Science. 3. Social Science. 4. English and American Literature. 5. The Science of Language. 6. Physiological Botany. 7. Systematic Botany 8 Zoology and Entomology. 9. Original Designs of Engineering Structures. 10. Veterinary Pathology and Materia Medica. 11. The Principles of Heredity. 12 Applied Mechanics. 13. Agricultural and Organic Chemistry 14. Physics. 15. Analytic Geometry and Calculus. 16. Horticulture and Forestry. 17 Agriculture. 18. French, German and Latin. 19. Advanced History and Ethics.

THE LIBRARY.

The library of the College contains about 1,000 volumes of standard library and scientific works, carefully chosen with a view to secure the greatest amount of valuable solid reading matter and material for extensive research.

Over 100 American, English, French, and German periodicals and magazines are taken for the use of the students. On the list is found the most important representatives of all the branches covered by the college curriculum.

A number of daily papers are kept on file and several weekly papers from each county in the state are taken for the students.

Besides the regular author, title and subject catalogue, there is a complete and minute classification on the shelves by subjects.

During the fall term Freshmen receive instruction on the following subjects: How to Use the Library; The Classification and Best Reference Books on Each Class; The Best General Reference Books and Their Use; Books and How to Read Them.

Students are allowed the use of books under the usual restrictions and either the librarian or assistant is present ten hours of the day to aid students in planning courses of reading and study connected with the work of the class-room, or work of a general nature.

FLORA WILSON, Librarian.

MUSIC.

Marie Lewis Chambers ---Director of Music and Teacher of Voice.
Genevieve Westermann, Teacher of Piano, Organ, Theory and Harmony.
Carrie Scott ---------- --Teacher of Violin and Guitar.

Exceptionally good advantages are here offered for the study of music. An accomplished corps of teachers is engaged to give instruction in its different branches.

A pleasing and commodious building is assigned to the particular use of the department. A number of good pianos and a pipe organ at the service of music students facilitate its work.

Sight Reading and advanced Choral classes are formed each term.

The singing of a chorus choir - trained by the Director—at the Sabbath Services is an interesting feature of College life. Concerts and recitals are given each term to which the public is invited, and rehearsals each week for criticism, to which the pupils only have admittance.

VOICE.

The "Old Italian" method is adhered to in the building of the voice. Attention is given to the cultivation of pure and true intonation, clean enunciation, the acquisition of good method in breathing and the attainment of correct style, dramatic expression, etc

The best technical works with songs of the English, Italian, French and German schools, church and concert music, the study of opera and oratorio, make up the course which may be completed in three or four years, according to the ability of the student.

PIANO,

A strictly classical course is followed in the study of the piano. Instruction will embody the latest and best ideas with regard to technique and the works of the highest classical and romantic schools will be studied.

PIPE ORGAN.

Students of Pipe Organ must be able to play the piano well.

THEORY AND HARMONY.

A knowledge of the theory of music will be urged as an essential part of each music student's education. Classes may be formed at any time.

VIOLIN.

The German method will be used in violin instruction Students will be given thorough training in the technical and artistic principles of violin playing. A judicious selection of Etudes and concert pieces will be made suited to the pupil's stage of advancement.

GUITAR.

Students wishing instruction upon the guitar will here have a good opportunity of gaining it.

RULES

Pupils may register for terms of ten lessons, not less.

Lessons lost by pupils will be made up or charged for at the discretion of the teacher.

All bills for music lessons are payable to special instructors in advance.

EXPENSES.

Voice, piano, organ, theory and harmony, violin and guitar lessons are seventy-five cents each, or $7.50 per term of ten lessons.

Theory and harmony, in classes of four, two dollars per lesson; twenty dollars per term of ten lessons.

All lessons are one-half hour in length,

Piano rent, one hour per day, two dollars per term. Sight singing lessons obligatory upon and free to all Freshmen.

MARIE L. CHAMBERS, Director.

Students 1895.

POST-GRADUATES.

NAME.	POSTOFFICE.	COUNTY.
Carver, George W., B. Ag.,	Ames,	Story.
Chestek, Alene, B. L ,	Bassett,	Chickasaw.
Hansen, N. E., B. Sc.,	Ames,	Story.
McCarthy, Clarice, B. L.,	Des Moines,	Polk.
Pammel, Emma E, B. Sc.,	La Crosse,	*Wisconsin*
Parkhill, Florence, B Sc.,	Ames,	Story.
Peterson, Wm. A., B. Sc.,	Harcourt,	Webster.
Porter, Kate, B. L.,	Woodbine,	Harrison.
Sirrine, Emma, B, Sc.,	Dysart,	Tama.
Wake, Arthur R.,	Cogad,	*Nebraska.*
Weaver, Carter B., B. Sc.,	Creston,	Union.
Youtz, L. A., B. A.,	Indianola,	Warren.

SENIORS.

NAME.	COURSE.	POSTOFFICE.	COUNTY.
Ashby, Arthur J.,	E. E.,	Iowa Falls,	Hardin.
Baker, Florence, A.,	Sc.,	Taylor,	Pottawattamie.
Ball, Elmer D.,	Sc.,	Little Rock,	Lyons.
Banks, A. J.,	M. E.,	Knoxville,	Marion.
Beecher, Robert S.,	C. E.,	Ida Grove,	Ida.
Blanche, Richard,	Vet.,	Conrad,	Grundy.
Bitting, A. W.,	Vet.,	Lafayette,	*Indiana.*
Brockhausen, C. E.,	M. E.,	Lansing,	Allamakee.
Brownlie, Ira Clifton,	Sc.,	Davenport,	Scott.
Cave, Charles R.,	E. E.,	Waverly,	Iowa.
Crawford, J. W.,	Sc.,	Newton,	Jasper.
Curtiss, Effie J.,	L.,	Nevada,	Story.
Danielson, J. G ,	Ag.,	Harcourt,	Webster.

NAME.	COURSE.	POSTOFFICE.	COUNTY.
Davidson, J. R.,	Sc.,	Bladensburg,	Wapello.
Davison, E. T.,	Vet.,	Burt,	Kossuth.
Duncan, Ruth,	L.,	Ames,	Story.
Duroe, C. R ,	E. E.,	Sioux Rapids,	Buena Vista.
Eck, W. J.,	E. E.,	Pleasant Plain,	Jefferson.
Eckles, C. H.,	Ag.,	Marshalltown,	Marshall.
Foster, A. H.,	E. E.,	Redfield,	Dallas.
Frisbee, J. B.,	Ag.,	Sheldon,	O'Brien.
German, Burt,	M. E.,	Des Moines,	Polk.
Gossard, W. E.,	Sc.,	Ames,	Story.
Goddard, Clarence.	C. E.,	Gilbert Sation,	Story.
Gunn, G. D.,	Sc.,	Lexington,	*Nebraska.*
Hardin, George W.,	Sc.,	Montezuma,	Poweshiek.
Helmer, A. C.,	M. E.,	Mechanicsville,	Cedar.
Hosford, A. C.,	M. E.,	Ames,	Story.
Hursey, Maude,	Sc.,	Hedrick,	Keokuk.
Hurst, N. C.,	M. E.,	Waterloo,	Blackhawk.
Hutchison, Chas. Stuart,	Sc.,	Ames,	Story.
Johnson, Raymond,	Vet.,	Richland,	Keokuk.
Johnson, Ira B.,	Sc.,	Ontario,	Story.
Lazell, Fred J.,	Sc.,	Greenfield,	Adair.
Lewis, C. C.,	M. E.,	Nira,	Washington.
Lewis, John W.,	C. E.,	Nira,	Washington
Lewis, H. T.,	M. E.,	Newton,	Jasper.
Lewis, L. L.,	Vet.,	Rhea's Mill,	*Texas.*
Louthan, G W.,	Ag.,	Sutherland,	O'Brien.
Lyford, F. R.,	C. E.,	Manly,	Worth
Mason, W. D.,	M. E.,	Toleda,	Tama.
Macey, E. C.,	E. E.,	Ames,	Story.
Maguire, Nellie,	L.,	Mitchell,	*So. Dakota.*
Maguire, Mary,	Sc ,	Mitchell,	*So. Dakota.*
McCready, W. R.,	C. E.,	Wyoming,	Jones.
McNeill, Mary B.,	L.,	Garden Grove,	Decatur.
Mellinger, E. A.,	E. E.,	Marsh,	Louisa.
Meyers, J. H.,	Ag.,	Templeton,	Carroll.
Mills, Lillian,	L.,	Jefferson,	Greene.
Moore, J. A.,	C. E.,	Moorland,	Webster.
Nelson, Hulda M.,	Sc.,	Gowrie,	Webster.
Oliver, J. W ,	Sc.,	Audubon,	Audubon.
Orr, M. J.,	E. E.,	Osage,	Mitchell.
Owens, Mabel Ruth,	L.,	Ames.	Story.

NAME.	COURSE.	POSTOFFICE.	COUNTY.
Placeway, Lola,	Sc ,	Ames,	Story.
Preston, John Miller,	Ag.,	Coon Rapids,	Carroll.
Roop, F. S ,	Vet ,	Childress,	*Virginia.*
Reed, Ervin E.,	Sc.,	Monticello,	Jones.
Rice, Thomas L ,	Vet.,	Decorah,	Winneshiek.
Rich, W. D ,	Sc ,	Ames,	Story.
Richmond, Albert,	C. E.,	Ames,	Story.
Rundall, Ethel B.,	Sc ,	Clarion,	Wright.
Sabin, G. D.,	M. E.,	State Center,	Marshall.
Sanborn, Roger,	Sc.,	Sioux Rapids,	Buena Vista.
Sample, J. C ,	C. E ,	Lebanon,	Van Buren.
Schleiter, Frank.	E. E ,	Ames,	Story.
Schulte, J. I.,	Ag.,	Carroll,	Carroll.
Sokol, John M.,	Sc.,	Onslow,	Jones.
Stevens, C. T.,	Sc.,	Alden,	Hardin
Thomas, W. J.,	C. E.,	Moingona,	Boone.
Walker, R. H.,	M. E.,	Brownville,	Mitchell.
Whipple, Etta J ,	Sc ,	South Ottumwa,	Wapello.
Wilson, Charles A.,	Ag ,	Ames,	Story.
Wilson, E. R ,	Ag.,	Traer,	Tama.
Woodburn, O. P.,	M. E ,	Rock Rapids,	Lyon
Wright, John I ,	Ag ,	Newton,	Jasper.
Wyatt, Laura,	Sc.,	State Center,	Marshall.—77

JUNIORS.

NAME.	COURSE	POSTOFFICE.	COUNTY.
Anderson, Mildred,	L.,	Jewell,	Hamilton.
Axtell, Grace,	L.,	Newton,	Jasper.
Ball, Carleton R ,	Sc.,	Little Rock,	Lyon.
Beardshear, Hazel Leoni,	L.,	Ames,	Story.
Blakemore, J F ,	C. E ,	Blockton,	Taylor.
Bonnell, Elmer N.,	Sc.,	Davenport,	Scott.
Bryan, W. A.,	Sc.,	New Sharon,	Mahaska.
Brown, Gates M.,	Sp.,	Ames,	Story.
Bicknell, Charles M..	Sp.,	Humboldt,	Humboldt.
Chamberlain, L. H.,	Sp.,	Des Moines,	Polk.
Cole, Agnes M.,	Sc.,	Ida Grove,	Ida.
Crawford, R. T ,	Sp.,	Castleville,	Buchanan.
Dunham, Bert,	E. E.,	Avoca,	Pottawattamie.

NAME.	COURSE.	POSTOFFICE	CUNTY.
Eckles, R. B.,	Ag.,	Marshalltown,	Marshall.
Elliott, James W ,	C. E.,	Sioux City	Woodbury.
Fibbs, Nettie A.,	C. E.,	Ida Grove,	Ida.
Foster, S. Edith,	Sc.,	Redfield,	Dallas.
French, Ella Weed,	Sc.,	Humboldt,	Humboldt.
French, Frank,	C. E.,	Humboldt,	Humboldt.
Gill, Percy C.,	Sc.,	Prairie City,	Jasper.
Goodman, L. M.,	M. E.,	Austin,	*Minnesota.*
Griggs, Samuel,	C. E.,	Rock Rapids,	Lyon.
Hamilton, Louise,	L ,	Nevada,	Story.
Harmon, Ray,	Sp ,	Independence,	Buchanan.
Harris, Oliver,	C. E.,	Coon Rapids,	Carroll.
Hocking, W. E.,	Sp.,	Newton,	Jasper.
Hoxie, W. E.,	Sp.,	Hampton,	Franklin.
Howe, Ruthella B.,	L.,	Dubuque,	Dubuque.
Jenkins, Alex. T.,	E. E.,	Sutherland,	O'Brien.
Johnson, Charles P.,	Sc.,	E. Des Moines,	Polk.
Kimble, George A.,	Ag ,	Roland,	Story.
King, Charlotte M.,	Sp.,	Des Moines,	Polk.
Landon, Robert R ,	E. E ,	Atlantic,	Cass.
Langlas, C. F.,	M. E.,	Waterloo,	Black Hawk.
Lanning, Julia,	L ,	Ames,	Story.
Little, Mertie,	L.,	Ames,	Story.
Lockwood, Nora B.,	Sc.,	George.	Lyon.
Mahoney, F. J.,	Sc.,	Boone,	Boone.
Mathews, Fred W ,	Sc.,	Dana,	Greene.
McClean, Carl H.,	Ag.,	Paton,	Greene.
McLain, Stella,	L.,	Ames,	Story.
Mead, Ira J.,	Ag.,	Colfax,	Jasper.
Mills, Claude C.,	Sc.,	Redfield,	Dallas.
Mills, S B.,	Ag ,	Ames,	Story.
Mighell, W.,	M. E.,	Holstein,	Ida.
Morrison, Ruth,	Sp.,	Hedrick,	Keokuk.
Morrison, J. S.,	C. E.,	Hedrick,	Keokuk.
Pattengill, E A.,	C. E.,	Osage,	Mitchell.
Pool, C. O ,	Sc ,	Iveyville,	Adams.
Porterfield, Lillian,	Sc.,	Minburn,	Dallas.
Purcell, Bertram,	Sp ,	Vinton,	Benton.
Read, Edwin,	Sc.,	Ames,	Story
Rhodenbaugh, E. T.,	Sc ,	Vail,	Crawford.
Richmond, Anna,	L.,	Ames,	Story

NAME.	COURSE.	POSTOFFICE.	COUNTY.
Rolfs, W. F.,	Sc ,	LeClaire,	Scott.
Roscoe, Ivan B.,	Sc ,	Camanche,	Clinton.
Rummel, Rose,	L.,	Olin,	Jones
Sherman, E. A.,	Sc.,	Livermore,	Humboldt.
Slaughter, F. L ,	C. E.,	Iowa Falls,	Hardin.
Smith, Hugh,	Sp.,	Des Moines,	Polk
Speers, Charles H.,	M. E.,	Oxford,	Johnson.
Steelsmith, George L ,	Sc.,	Conrad Grove,	Grundy.
Taylor, Henry C.,	Ag.,	Wilsonville,	Van Buren.
Tilden, Minta,	Sc ,	Ames,	Story.
Weaver, R. G ,	Sc.,	Creston,	Union.
Wentch, W. W.,	E. E.,	Traer,	Tama.
Wilson, J. W.,	Ag.,	Traer,	Tama.
Wilson, B. W.,	Ag.,	Ames,	Story.
Zinser, Arthur Louis,	Sc.,	Peach,	Buena Vista.
Zorn, George W.,	C. E.,	Montezuma,	Poweshiek– 70.

SOPHOMORES.

NAME.	COURSE.	POSTOFFICE.	COUNTY.
Baker, D. Jeanette,	Sp.,	Eagle Grove,	Wright.
Barger, Mary A.,	Sc.,	Ontario,	Story.
Bergeman, C. A.,	M E.,	Cromwell,	Clay.
Bierbaum, E. C ,	Sc.,	Garnavillo,	Clayton
Bigelow, Robert E ,	E. E.,	Ames,	Story.
Birkett, Lindley,	Ag.,	West Liberty,	Muscatine.
Booth, Joel C.,	Sc.,	Newton,	Jasper.
Bouska, Frank W.,	Ag ,	Protivin,	Howard.
Bossert, B. E ,	E. E.,	Jefferson,	Greene.
Brewer, Guy S ,	Sc.,	Des Moines,	Polk.
Brown, Andrew,	Sc ,	LeClaire,	Scott.
Burnip, James R.,	Sc.,	Alta,	Buena Vista.
Cammack, Laura,	Sp.,	Salem,	Henry.
Christy, Frank P.,	Sp.,	Des Moines,	Polk.
Cole, Jessie,	L.,	Ames,	Story.
Cole, O. R,,	E. E.,	Creston,	Union.
Connor, John,	Sp.,	Derby,	Lucas.
Cooper, George,	Ag.,	Ontario,	Story.

NAME.	COURSE.	POSTOFFICE.	COUNTY.
Cooper, Mary,	Sp.,	Des Moines,	Polk.
Crone, J. V.,	Sc.,	Marathon,	Buena Vista.
Cutcomp, Curtis,	C. E.,	Columbus Junct.,	Louisa.
Damon, Philip,	Ag.,	3400 Russell ave. St Louis,	*Missouri.*
Davidson, Ole,	C. E.,	Deer Creek,	Worth
Dawson, Edna G.,	L.,	Clarion,	Wright.
Devine, W. J.,	E E.,	Morton's Mills,	Motgomery.
Dotson, E. E.,	Sp.,	Colfax,	Jasper.
Doxsee, Gwendolen,	Sp.,	Rolfe,	Pocahontas.
Duroe, Louis A.,	Sc.,	Sioux Rapids,	Buena Vista.
Dyer, Harry E ,	E. E.,	Mason City,	Cerro Gordo.
Dygert, J. A.,	E. E ,	Webster City,	Hamilton.
Edwards, Rowena,	L.,	Parkersburg,	Butler.
Ely, Kirk Henry,	E. E.,	DeSmet,	*South Dakota.*
Evans, H. J.,	Ag ,	Hartley,	O'Brien.
Fales, A. L.,	Sc.,	Newton,	Jasper
Fellows, L. Mae,	L.,	Montour,	Tama.
Foster, Charles,	E. E.,	Burt,	Kossuth
Franklin, T. Z.,	Sp ,	Lawrence,	*Kansas.*
Garberson, W. C.,	Sc ,	Alta,	Buena Vista.
Gerla, Louis,	Sc.,	Alton,	Sioux.
Gersbach, Otto,	C E.,	Montezuma,	Poweshiek.
Gilliland, George,	E. E ,	Jefferson,	Greene.
Greeley, Blanch,	L.,	Ames,	Story.
Groneweg, H. E.,	Sp.,	Council Bluffs,	Pottawattamie.
Gunn, R. M.,	Sp.,	Lexington,	*Nebraska.*
Hall, Mamie,	L.,	Ames,	Story.
Haning, Harry,	Sc.,	Amador,	Wapello.
Hartman, Clarence,	Sc ,	Des Moines,	Polk.
Heald, G. D ,	E. E.,	Farley,	Dubuque.
Hollembeak, R. H.,	C. E.,	Casey,	Guthrie.
Houghton, W. A.	Ag.,	Norway,	Benton.
Hunt, Waldo F ,	Ag.,	Ocheyedan,	Osceola.
Hutchinson, J A.,	Min. E.,	Ames,	Story.
Hull, M. R.,	E. E.,	New Sharon,	Mahaska
Jensen, James,	Sc.,	Hull,	Sioux.
Johnson, Charles C.,	Sc.,	Summit,	Story.
Jones, Margaret M.,	Sc ,	Manly,	Worth.
Jones, Ward M.,	C. E.,	Allison,	Butler.
Joseph, W S.,	C. E.,	Creston,	Union

NAME.	COURSE.	POSTOFFICE.	COUNTY.
King, Robert E.,	E. E.,	Keokuk,	Lee.
Knapp, Helen,	L.,	Lake Charles,	*Louisiana*.
Kribs, Edwin P.'	E. E.,	Mitchellville,	Polk.
Kuppinger, F. J.,	Sc.,	Mason City,	Cerro Gordo.
LaRue, Katherine,	L.,	Van Horn,	Benton
Lebuhn, Charles E.,	Sc.,	LeClaire,	Scott.
Lincoln, Francis,	Min. E.,	Ames,	Story.
Linebaugh, Frank,	E. E.,	Keokuk,	Lee.
Linn, Samuel H.,	Sp.,	Shelby,	Shelby.
Mast, T. W.,	Ag.,	Agency,	Wapello
McConnon, Frank,	Sp.,	Monticello,	Jones.
McBeth, Nettie,	L.,	Shellsburg,	Benton
McWilliams, G. B.,	C. E.,	Allison,	Butler
Morphy, Ina,	Sc.,	Cherokee,	Cherokee.
Myers, Charles A.,	C. E.,	Colesburg,	Delaware.
Needham, Frank,	E. E.,	Ida Grove,	Ida.
Newell, Wilmon,	Sc.,	Hull,	Sioux.
Nichols, W. C.,	M. E.,	Clear Lake,	Cerro Gordo.
Parsons, W. H.,	C. E.,	Columbus J'ction,	Louisa.
Patterson, George W.,	E. E.,	Carroll,	Carroll.
Perrain, A. J.,	C. E.,	Mapleton,	Monona.
Pillsbury, Grace E.,	Sp.,	Eagle Grove,	Wright.
Preston, E. G.,	Ag.,	Battle Creek,	Ida.
Rae, Allen,	E. E.,	Dow City,	Crawford.
Read, Russell,	Sc.,	Ames,	Story.
Redmon, Edith,	L.,	Highland Center,	Wapello.
Reed, Emerson,	E. E.,	Knoxville,	Marion.
Rice, A. C.,	Sp.,	Hamburg,	Fremont.
Robinson, W. L.,	Sc.,	Armstrong,	Emmett.
Rogers, L. E.,	Sp.,	Minburn,	Dallas.
Rolfs, F. M.,	Sc.,	LeClaire.	Scott.
Russell, Charles F.,	E. E.,	Storm Lake.	Buena Vista.
Rutherford, Margaret H.,	Sc.,	Algona,	Kossuth.
Sackett, Anna E.,	Sc.,	Middle River,	Adair.
Sample, Arthur F.,	Ag.,	Lebanon,	Van Buren.
Sampson, Ernest,	E. E.,	Agency,	Wapello.
Sansen, Charles J.,	Sp.,	Aurelia,	Buena Vista.
Seaver, Annie O.,	Sp.,	West Mitchell,	Mitchell.
Sexton, Frank,	Sc.,	Ames,	Story.
Schmidt, Herman,	M. E.,	Davenport,	Scott
Schott, Robert,	Sp.,	What Cheer,	Keokuk.

NAME.	COURSE.	POSTOFFICE.	COUNTY.
Scurr, Joseph H.,	Ag.,	Gilman,	Marshall.
Shaum, R. J.,	Ag.,	Columbus J'ction,	Louisa.
Sheppard, C A.,	Sc.,	Rock Rapids,	Lyon.
Smith, Robert D.,	M E.,	Randalia,	Fayette.
Spencer, Frank,	E. E.,	Maquoketa,	Jackson.
Stanton, E. M.,	Sc.,	Ames,	Story.
Sterns, George L.,	E. E ,	Steamboat Rock,	Hardin.
Stevens, Olive,	L.,	Boone,	Boone.
Stimson, John,	Sc.,	Conway,	Taylor.
Tansey. R. W.,	M E.,	New Providence,	Hardin.
Tanton, C. E.,	Sc ,	Alton,	Sioux
Thomas, Hannah M.,	Sc.,	Corning,	Adams.
Tilden, W. C.,	Sc.,	Ames,	Story.
Townsend, E. A .	E. E.,	DeWitt,	Clinton
Van Campen, M.,	E E.,	Boone,	Boone.
Vernon, J J.,	Ag.,	Bangor,	Marshall.
Walker, Annie May,	Sc ,	Brownville,	Mitchell.
Whitney, Fred. L.,	Sc.,	Osage,	Mitchell.
Wilson, Jasper,	Ag.,	Ames,	Story
Winne, Lawrence,	Sc.,	Humboldt,	Humboldt

118.

FRESHMAN.

NAME.	COURSE.	POSTOFFICE.	COUNTY.
Adamson, R. K ,	Sc.,	Dana,	Greene.
Adamson, Arnott A.,	Sc.,	Newton,	Jasper.
Adamson, M. C.,	Sc.,	Dana,	Greene.
Ady, James Frank,	Sc.,	Odebolt,	Sac.
Aldrich. James C.,	Sc.,	Schaller,	Sac.
Allen, A. C.,	C. E.,	Nevada,	Story.
Anderson, Raymond C.,	M. E.,	Ames,	Story.
Arbuthnot, Katharene,	Sp.,	Des Moines,	Polk.
Austin, Jessie,	Sp.,	Clarion,	Wright.
Baker, J. C.,	Sc.,	Lucas,	Lucas.
Baker, Lora,	Sp.,	Lucas,	Lucas.
Barclay, Ralph W.,	Ag.,	West Liberty,	Muscatine.
Bassett, Mabel,	L.,	Sioux City,	Woodbury.
Beatty, Esther,	L.,	Newton,	Jasper.

NAME.	COURSE.	POSTOFFICE.	COUNTY.
Bisbee, Marion E.,	E. E ,	Ames,	Story.
Bishop, E. T,.	Sc.,	Hartland,	Marshall.
Bissell, Percy,	Sp.,	Ames,	Story.
Blanche, Lillie	Sp ,	Conrad Grove,	Grundy.
Boardman, Homer,	C. E ,	Nevada,	Story.
Boardman, Frank M.,	E. E.,	Nevada,	Story.
Bonnell, J. N.,	E. E.,	Davenport,	Scott.
Bonwell, May Leora,	Sc ,	Viola Center,	Audubon.
Boyd, O. S.,	Sc.,	Roland,	Story.
Boyd, Alice,	Sp .	Paullina,	O'Brien.
Bozarth, Harvey,	M. E.,	Cedar Falls,	Black Hawk
Bradley, Vetra,	L.,	Ames,	Story.
Bristol, Cyrus J.,	M. E.,	Schaller,	Sac.
Brock, Herbert E.,	C. E.,	Mason City,	Cerro Gordo.
Brown, Olive Z.,	Sc.,	Council Bluffs,	Pottawattamie.
Brown, Grace Estelle,	L ,	Garden Grove,	Decatur.
Brown, S C.	M. E ,	Eddyville,	Wapello.
Brown, Harry F.,	Sc.,	Ames,	Story.
Brown, J. Clarence,	E. E ,	Dexter,	Dallas.
Bryan, W. Emmet,	Ag.,	New Sharon,	Mahaska.
Burley, Herbert Loring,	E. E.,	Tama,	Tama
Burnham, Ena Mabel,	L.,	Aplington,	Butler.
Bush, W. R.,	Ag.,	St. Louis,	*Missouri.*
Campbell, Clare,	Sp.,	Newton,	Jasper.
Carter, E A.,	M. E.,	Des Moines,	Polk.
Chestek, Lillian A.,	Sp.,	Bassett,	Chickasaw.
Clark, Glenn C.,	Sc.,	Belmond,	Wright.
Cohn, Joseph B.,	E. E,,	Knoxville,	Marion.
Corderman, David.,	Sc ,	Lake View,	Sac
Cornell, Harry F.,	Ag.,	Mitchell,	Mitchell.
Craig, Robert A.,	Vet ,	Waterville,	*Kansas.*
Crane, Orin E.,	Sc.,	Central City,	Linn.
Crosbie, Robert F.,	M. E.,	Paullina,	O'Brien.
Curtis, G. W.,	Sc.,	Redfield,	Dallas.
Curtiss, Guy C.,	E. E.,	Nevada,	Story.
Davies, Autumn,	L.,	De Smet,	*South Dakota.*
Davies, William G ,	Sc.,	De Smet,	*South Dakota.*
De Peel, Irena,	L.,	Ames,	Story.
Dobler, Gertrude L.,	Sc.,	Vail,	Crawford.
Dodge, Gordon F.,	M. E ,	Jefferson,	Greene.
Doolittle, May Belle F.,	Sc.,	Cresco,	Howard.

NAME.	COURSE	POSTOFFICE.	COUNTY
Drennan, Georgia,	Sp.,	Renweck,	Humboldt.
Duncan, W. S.,	E. E,	Clinton,	Clinton
Dunkle, Effie E.	Sp..	Gilbert Station,	Story.
Ehle, Mark,	Sc.	Marshalltown,	Marshall.
Ellis, Ada,	L.,	Ames,	Story.
Ellis, Stella,	L.,	Ames,	Story.
Ellis, Sadie,	L,	Ames,	Story.
Escher, B. S.	E. E.,	Clarence,	Cedar
Fay, Oliver J.,	Sc.,	Postville,	Allamakee.
Ferguson, A. R,	E. E.,	New Hampton,	Chickasaw.
Filson, Lawrence L.,	Ag.,	Des Moines,	Polk.
Franklin, Orville S,	Sc.,	Mitchellville,	Polk.
Franklin, Elmer,	Sc.,	Platteville,	Taylor.
Forbes, R. B.,	Sc,	Des Moines,	Polk.
Galloway, Thomas.	M. E.,	Keokuk,	Lee.
Galloway, James,	M. E.,	Keokuk,	Lee.
Gaskill, Elwyn G.,	Sp.,	Corwith,	Hancock.
Gilmore, J. M.,	E. L,	Osage,	Mitchell
Goble, Racine D.,	Sc.,	Ames,	Story
Graham, Elmer,	Sp.	Union Mills,	Mahaska
Grant, Theron,	Sc,	Rhodes,	Marshall.
Grover, William H.	E E.,	Sterling Center,	*Minnesota.*
Grettenberg, Howard N,	Ag,	Mitchell,	Mitchell.
Gunzenhauser, A. E.,	E E.,	Homestead,	Iowa
Hamilton, Ethel,	L.,	Ames,	Story.
Hammer, M J,	C. E.,	Des Moines,	Polk.
Hanes, Pasco E,	E. E,	Maynard,	Fayette
Hayter, Rohland,	M. E,	Manly,	Worth.
Hedberg, Chancey C.,	M. E,	Dayton,	Webster.
Helmer, C. C.,	Sc.,	Mechanicsville,	Cedar.
Henderson, O. J.,	Sc.,	Randall,	Hamilton.
Henkel, Coral T,	Sp,	Linn Grove,	Buena Vista.
Hibbard, Benjamin H.,	Ag,	Paullina,	O'Brien
Hicks, Calvin,	Sc,	Des Moines,	Polk.
Hill, Birney B,	Sc.,	Ames,	Story.
Hook, Sadie,	L,	Hedrick,	Keokuk.
Hoyman, Frank S.,	E. E.,	Stanwood,	Cedar.
Hubbard, Jerome.	Sc.,	Monmouth,	Jackson
Hull, Monroe R,	E. E,	New Sharon,	Mahaska
Hunter, Harry E.,	C. E..	Newton.	Jasper.
Hurst, Frank S,	E. E.,	Delmar,	Clinton.

NAME.	COURSE.	POSTOFFICE.	COUNTY.
Huston, Archie M.,	Sc.,	Conway,	Taylor.
Jenkins, Lewis N.,	E. E.,	Clearfield,	Taylor.
Johnson, Ewing M.,	Sc ,	Ontario,	Story.
Johnston, Jennie E.,	Sc.,	Hampton,	Franklin
Jones, Irene,	Sc.,	Manchester,	Delaware.
Kellam, Katie,	Sc.,	Alton,	Sioux.
Kelley, Thomas R.,	Sp.,	Dakota City,	Humboldt.
King, Thomas A.,	Sp.,	Monticello,	Jones.
Knight, Addie,	Sc ,	Holmes,	Wright.
Kreamer, Benjamin F.,	Sc.,	Exira,	Audubon.
Kramme, Anda,	L ,	Ames,	Story.
Kyle, J. C.,	E. E.,	Glidden,	Carroll.
Langworthy, Emma,	Sp.,	Massena,	Cass.
Laughlin, Chalmers F.,	E. E.,	Toledo,	Tama.
Lentner, Sybil,	Sc.,	Dahlonega,	Wapello
Letts, Herman,	E. E.,	Mason City,	Cerro Gordo.
Lewis, Fred N.,	C. E.,	Macedonia,	Pottawattamie.
Little, Edward,	Sc ,	Ames,	Story.
Love, John B.,	Ag.,	Byron,	*Illinois.*
Luick, Lee,	Sc.,	Belmond,	Wright.
Marston, Walter S.,	M E.,	Winnebago,	*Illinois.*
Meade, J. A ,	Sc.	Marshalltown,	Marshall.
Meyst, William,	Vet.,	Milwaukee,	*Wisconsin.*
Meeker, Royal,	M E ,	Paullina,	O'Brien.
McClain, A. C ,	E. E ,	Ames,	Story.
McCusker, Clarence J.,	E. E ,	Decorah,	Winneshiek.
McFerron, E. E.,	Sc ,	Montezuma,	Powshiek.
McGavren, Lawrence E ,	M. E.,	Missouri Valley,	Harrison.
McKinley, John P ,	Sc.,	Postville,	Allamakee.
McKinley, J J.,	Sc ,	Postville,	Allamakee.
McKay, William,	Sc.,	Ames,	Story.
McLaughlin, C. J.,	Sc.,	Monticello,	Jones.
McNeill, Norah,	L ,	Garden Grove,	Decatur.
McWilliams, Pearl,	L ,	Allison,	Butler.
Mills, Roger C.,	Ag ,	Des Moines,	Polk.
Minkler, Genevieve,	L.,	Nevada,	Story.
Moore, Lorenzo K ,	Sc ,	Missouri Valley,	Harrison
Morgan, David W.,	E E.,	Lucas,	Lucas.
Morse, Reginald K.,	E. E.,	Atlantic,	Cass.
Nelson, Hilda,	Sp.,	Gowrie,	Webster.
Nichols, Fay I.,	C. E ,	West Liberty,	Muscatine.

NAME.	COURSE.	POSTOFFICE.	COUNTY.
Nickson. Harry,	Sp .	Humboldt,	Humboldt.
Nott. Fred S.,	E. E.,	Calumet,	O'Brien.
Ostrus, Oliver E.,	Ag.,	Wiota,	Cass
Parker, Jessie,	Sc.,	Ames,	Story.
Parvin, Hamilton,	C. E.,	Newton,	Jasper
Patton, Emma Luverne,	Sp ,	Luverne,	Kossuth.
Payne. R. S.,	Sc.,	Ames,	Story
Peffer, Mary E.,	Sc.,	Battle Creek,	Ida
Penny, Truman A ,	Sp.,	Logan,	Harrison.
Perry, Eugene D.,	Sc ,	Redfield,	Dallas.
Pierce, Katie,	Sc.,	Osage,	Mitchell.
Platt, Mae H ,	Sp.,	Eagle Grove,	Wright
Read, Bessie,	L.,	Ames,	Story.
Rentz, Charles B.,	C. E.,	Oxford,	Johnson.
Rice, Stephen O ,	Ag,.	Decorah,	Winneshiek.
Rice, Minnie R.,	L ,	Charles City,	Floyd.
Rice. Maude L ,	L.,	Charles City,	Floyd.
Richardson, Walter,	M. E.,	Keokuk,	Lee
Richmond. John J.,	Ag.,	Armstrong,	Emmett.
Ritland, Osmond,	Ag.,	Huxley,	Story.
Roberts, Ernest E.,	Sc.,	Alton,	Union.
Robinson. L. Harter,	Sc.,	Des Moines,	Polk.
Rogers, Burton R.,	Sc ,	Ames.	Story.
Ross, Bertha.	Sp .	Hawarden,	Sioux
Russell. Stella,	L ,	Storm Lake.	Buena Vista.
Rundall, Homer E.,	Sc ,	Clarion,	Wright.
Searles, Fred P.,	Sc ,	Monticello.	Jones.
Shaw, A Frederick,	Sc.	Tipton,	Cedar.
Skinner, H W.,	E. E.,	Osage,	Mitchell.
Smith, Hannah,	Sp.,	Charles City,	Floyd.
Smith, Alice L.,	L.,	Battle Creek,	Ida.
Smith, John C.,	Sc .	Monticello,	Jones.
Smith, Lu Richardson,	L.,	Algona,	Kossuth.
Smith, Grace B.,	L ,	Algona,	Kossuth.
Smith, Matthew G.,	Ag ,	New Hampton,	Chickasaw.
Snelson, Dolly M.,	Sc.,	Massena,	Cass
Snelson, Maude,	Sc.,	Massena,	Cass
Snyder, Mark E ,	Sp.,	Ames,	Story.
Spring, C. F ,	Sc.,	Ames,	Story.
Stewart, Mabel J.,	L.,	Gilbert Station,	Story.
Starmson, James H.,	Sc ,	Conway,	Taylor.

NAME	COURSE.	POSTOFFICE.	COUNTY.
Stoakes, Maude,	Sc.,	Traer,	Tama.
Stoakes, Maggie B.,	Sc.,	Traer,	Tama.
Swearinger, Raym'nd G.,	Sc.,	Albion,	Marshall.
Sweet, Marian J.,	Sc.,	Hampton,	Franklin.
Taft, Charles S,	M E.,	Monroe,	Jasper.
Taylor, May,	L.,	Olin,	Jones.
Tegland, Josephine,	Sp.,	Gilbert Station,	Story.
Thomas, W. L.,	Sp.,	Corning,	Adams.
Thomas, E. R,	Sc.,	Redfield,	Dallas.
Tilden, Charles G.,	Sc.,	Ames,	Story.
Tuttle, Elbert B.,	E. E.,	Algona,	Kossuth.
Vickerman, Harry E.,	M. E.,	Mason City,	Cerro Gordo.
Warden, W. M.,	Ag.,	Van Cleve,	Marshall.
Watson, James C.,	Sp.,	Hull,	Sioux.
Weaver, Walter L.,	Sc.,	Iowa Falls,	Hardin.
Webber, Lorena,	Sc.,	Renwick,	Humboldt.
Whaley. H. H.,	Sp,	Applington,	Butler.
White, John D.,	Sc.,	Olin,	Jones.
Whitmore, Alvah P.,	Ag.,	West Union,	Fayette.
Williams, Ira A.,	Sc.,	Manly,	Worth.
Wilson, Mary,	Sc,	Traer,	Tama.
Wilson, Harry H.,	Sc.,	Traer,	Tama.
Wright, Florence C.,	L,	Ames,	Story.
Yoeman, L. E,	Sc,	Hartley,	O'Brien.
Younie, Lewis E.,	E. E,,	Odebolt,	Sac.
Young, Mae T.,	Sc.,	Traer,	Tama.
Zellhoefer, G. W.,	Vet.,	Grand Junction,	Greene.

PREPARATORY.

NAME.	POSTOFFICE.	COUNTY.
Allen, Mamie,	Ames,	Story.
Brooks, George W.,	Sioux City,	Woodbury.
Canady, Nora M.,	Ontario,	Story.
Carpenter, Edwin,	Botoit,	Lyon.
Cooper, John G.,	Ontario,	Story.
Crane, Maud E.,	Ames,	Story.
Ellis, Charles E.,	Ontario,	Story.
Farwell, S. W.,	Monticello,	Jones.
Ferguson, Lizzie I.,	Ida Grove,	Ida.
Fromantal, Ernestine,	Des Moines,	Polk.

NAME.	POSTOFFICE.	COUNTY.
Fox, George M ,	Dallas Center,	Dallas.
Griffin, Rose L.,	Masonville,	Delaware.
Hollingsworth, Dennis E.,	Peru,	Madison.
Hunt, Clyde,	Ridgedale,	Polk.
Jackson, Keel,	Spring Hill,	Warren.
Kettleson, Louis,	Sioux City,	Woodbury.
Malcolm, Norman,	Ames,	Story.
McDill, Wilson F.,	Creston,	Union.
Meiers, Charles H.,	Ames,	Story.
Moore, Willis,	Monticello,	Jones.
Morgan, Evans,	Oskaloosa,	Mahaska.
Rouzer, Clarence,	Ontario,	Story.
Ruby, C.,	Wilsonville,	Van Buren.
Scott, Jesse,	Eagle Grove,	Wright.
Smith, John,	Ontario,	Story.
Steele, Carl A ,	Ogden,	Boone,
Thornburg, G. G.,	Orchard,	Mitchell.
Wood, Mervin,	Burchinal,	Cerro Gordo 26

SPECIAL DAIRY STUDENTS.

NAME.	POSTOFFICE.	COUNTY.
Baldwin, W. S.,	Orchard,	Mitchell
Barron, Arthur,	Packwood,	Jefferson
Baskins, George R.,	Janesville,	Bremer.
Boberg, J. P.,	Des Moines,	Polk
Burton, R H.,	Port Jones,	*California.*
Craven, Herbert,	Massena,	Cass.
Cowperthwaite, H. W.,	Greenfield,	Adair.
Griffin, Leland,	Conway,	Taylor
Jensen, Bertel.	Elkhorn,	Shelby.
Kadler W. J..	Protivin,	Howard.
Moore, W.,	Bucyrus,	*Kansas.*
Rombough, H. M.,	Hull,	Sioux.
Schlegal, Oscar,	Endor,	Douglass.
Soenke, Peter,	Walcott,	Scott.
Sunderlin, F. R.,	Janesville.	Bremer.
Vavrichek, F.,	Spirit Lake,	Dickinson.
Walton, Charles H.,	Newtonville,	Buchanan.
Warner, W. M.,	Gilmore,	Pocahontas.
Weems, E.,	Solomon's,	*Maryland.* —19

WINTER STUDENTS IN AGRICULTURE AND DAIRYING.

NAME.	POSTOFFICE.	COUNTY.
Anderson, Andrew S.,	Alsen,	*South Dakota.*
Barron, Arthur,	Packwood,	Jefferson.
Burton, Realto H.,	Etna Mills,	Siskiyon.
Calonkey, Fred B.,	Woodward,	Dallas.
Cook, Selden.	Haysville,	*Missouri.*
Gaymon, Harry,	Solon,	Johnson
Gosse, August,	Vesta,	Buchanan.
Gosse, Henry,	Vesta,	Buchanan.
Gray, Fred H.,	Springdale,	Cedar.
Griffith, Willis W.,	Ogden,	Boone.
Guengerich, Lewis J,	Amish,	Johnson.
Lane, J. W.,	Buffalo Forks,	Kossuth.
Mayer, Louis W.,	Wakonda,	*South Dakota.*
McKay, G. W ,	Geneseo,	Tama.
Mondt, Albert,	Boone,	Boone.
Nad, K. T.,	Ellsworth,	Hamilton.
Orthel, Adolph,	Wesley,	Hancock.
Patton, Fred R ,	Clinton,	*Kansas.*
Scheiber, Will H.,	Four Corners,	Jefferson
Senn, Samuel,	Highland,	Madison.
Soenke, Peter,	Walcott,	Scott.
Spaulding, George T.,	Ruthven,	Palo Alto.
Stevens, Frank,	Turney's Station,	*Missouri.*
Swanson, Victor E.,	Alsen,	*South Dakota.*
Tonsfeldt, John,	Ogden,	Boone.
Vavrichek, Frank,	Spirit Lake,	Dickenson.
Welling, Elmer,	Richland,	*Kansas.*
Williams, George,	Dickens,	Clay.
Wilson, G W.,	Ames,	Story —29.

JUNIOR SPEAKERS, 1895.

ASSIGNED BY REASON OF SCHOLARSHIP.

C. R. Ball,
Hazel L. Beardshear,
J. F. Blakemore,
W. A. Bryan,
E N. Bonnell,
Nettie A. Fibbs,
Nora Lockwood,
F. J. Mahoney,
I. J. Mead,
C. H. Speers,

SENIOR SPEAKERS, 1895.

EACH SPEAKER HAS THE HIGHEST STANDING IN THE COURSE REPRESENTED.

J. I. Schulte, Course in Agriculture
A C. Helmer, Course in Mechanical Engineering.
F. J. Lazell, Course in the Sciences.
Clarence Goddard, Course in Civil Engineering.
A. H. Foster, Course in Electrical Engineering.
L. L. Lewis, Course in Veterinary Medicine.
Mabel R. Owens, Course for Ladies.

The remaining three speakers are those having the highest average standings of all the candidates for degrees from all the courses excepting those that represent some particular course.

Effie J. Curtiss,
Laura Wyatt,
N. C Hurst.

INDEX.